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ABSTRACT

This document consists of the preview issue and first five issues of a new newsletter designed to alert members of the higher education community to driving forces and potential developments in the macroenvironment that constitute threats or opportunities to colleges and universities. It reports news from the social, technological, economic, environmental, and political sectors, local through global. Among this series' major articles are the following: "What's on the Horizon for Higher Education?" (George Keller); "A New Social Charter for Higher Education?" (Ian Wilson); "Education in the Information Society" (Peter C. Bishop); and "It's Time to Re-Invent Higher Education--A Strategic Assessment" (David Pearce Snyder). Other articles discuss reasons higher education needs to beware of technology, why increasing the ties between colleges and universities and business may lead to conditions that threaten academic freedom, the issue of establishing a free-standing black cultural center on campus, and an examination of three college teachers who won teaching awards yet were denied tenure. (GLR)

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on the horizon

the environmental scanning newsletter
for leaders in higher education

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the newsletter of environmental scanning in higher education

on the horizon

Preview Edition, Summer 1992

Editor's Column

WELCOME TO OUR FIRST ISSUE

We live in turbulent times. During the startling developments in the former Soviet Union last year, David Brinkley stated that "each day seems to bring the dawn of a new era." Certainly the fall of the Berlin wall, the unification of Germany, the breakup of the Warsaw Pact, and the breakup of the Soviet Union, have transformed our world.

On the horizon is the possibility that the European Community may include Eastern Europe in the largest free trade zone the world has yet seen. In response, other free trade zones are in the making (e.g., the North American Free Trade Treaty between Canada, the United States and Mexico; Australia and New Zealand, and several South American countries). Are these signals of another momentous event—international free trade with concomitant dislocations of workforces and industries? If so, what are the implications for continuing education and for the globalization of the curriculum?

On the Horizon alerts members of the higher education community to driving forces and potential developments in the macroenvironment that constitute threats or opportunities to colleges and universities. We intend to live up to our title, *On the Horizon*, and even to our ever-so-faint subtitle on the masthead, *Beyond the Horizon*. To do so, we have asked a number of individuals to serve as consulting and contributing editors—some prominent in higher education, others prominent within the futures field. From time to time they will contribute

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United Way Strategic Institute Publishes *What Lies Ahead: A Decade of Decision*

The United Way Strategic Institute's Environmental Scanning Committee has just released the 1992-93 edition of *What Lies Ahead*. In this publication, the Committee updated the nine forces of change in American society identified in their 1989 publication, *What Lies Ahead: Countdown to the 21st Century*. These forces of change, called "ChangeDrivers" by the Committee, are summarized as follows:

ChangeDriver 1: The Maturation of America. The population continues to age, with the consequence that U.S. culture is shifting from a youth orientation to one focused on aging. The age groups that will demand the most attention are the 35- to 54-year-olds and those over 80 (the fastest-growing segment of the population). Political activism, reflecting an older population, will be pragmatic and measured.

The growth of the U.S. workforce will continue to slow, implying a more mature and experienced workforce. New technologies and changing job conditions will challenge workers. Employers will increasingly offer older workers phased retirement, flexible work schedules, and short time projects. More middle aged workers will start their own firms as opportunities for advancement are increasingly limited.

Not only is the population maturing, but the physical infrastructure of the country (roads, bridges) is aging, and will demand more and more attention in this decade. Government will increasingly join with business to cope with infrastructure repair costs.

ChangeDriver 2: The Mosaic Society. The diversity of America's population will become more pronounced, and, perhaps, increasingly polarized between the educational and economic haves and have nots. It is imperative that Americans and their institutions recognize and support the value of diverse cultures within the society. Racial and ethnic tensions will remain high. Schools will implement alternative options like magnet schools, year-round schools, and alternative teacher certification to address issues of quality, cost-effectiveness and teacher shortages. Minorities and women will comprise a larger proportion of the workforce. The ability to manage a diverse workforce will remain important due to its increasingly multilingual and multicultural nature. There will be greater availability of child-care benefits, including parental leave and flexible work hours. Workers will have more benefits, but will share in bearing their costs. Finally, minorities will continue to seek greater political influence commensurate with their numbers.

ChangeDriver 3: Redefinition of Individual and Societal Roles. There will be a continuing shift of responsibilities between societal sectors and between individuals and institutions. Reforms in public education will continue to emphasize the decen-

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pieces on developments they see on (or perhaps beyond) the horizon that could affect your work and future in higher education. They will also speculate on the implications these developments have for colleges and universities. You may not always agree with what they say, but we hope you will agree that the material stimulates your thinking.

In this preview edition we categorize our news into social, technological, economic, environmental, and political (STEEP) sectors, and seek to include developments in these areas at the local and global arenas. In subsequent editions we will add four other sections. One, *Issues*, is an ongoing Delphi process focusing on issues facing higher education. Each edition will relate your views of these issues, their importance, where they are headed, and their implications for colleges and universities. Another, *Tools*, is a look at both new and proven planning tools from inside and outside the educational establishment. These tools will include software, new data acquisition technologies, standardized instruments, and planning techniques, such as group process and conference management innovations. Another, *Using Scanning Information*, will illustrate how some colleges and universities use scanning information in academic or institutional planning. And finally, *Letters to the Editor*, a section in which you may respond directly to items and their implications in case you disagree with our assessments or wish to add to them.

You are invited to participate in all sections of this newsletter. In fact, the sections on *Issues*, *Letters* , and *Using Scanning Information* depend upon your input. We welcome items that serve as signals of change in any of the STEEP sectors. Please also provide a statement of the implications of these signals for higher education. If we use your contribution, we will give you credit for its submission. This has to be one of the easiest ways to get your name in print that we know!

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tralization of authority to teachers and parents (school-based management) and choice programs. The pressure from individuals for empowerment to act for themselves will increase. (The focus on wellness illustrates a movement from a problem-based care system to one requiring more personal responsibility for eating and living "right.") Government support of human services will continue the pattern established in the 1980s, when authority and financial responsibility passed from the federal government to states and localities. Funding increases are not likely, given growing fiscal problems at all levels of government. There will be continued privatization of government services, including prisons and social services. By the end of the 1990s, there will be greater focus on individual self-sufficiency and less reliance on insti-

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Master's Program for International Executives

The London Business School announced a unique master's degree program for senior international executives. Executives, sponsored by their employers, will be able to keep their jobs during the two-year program that will culminate in a master's degree in the science of management. No more than 30% of the students will come from any one country. Participants will be expected to speak at least two languages, and will travel to nine sessions to be held in London, Berlin, and other locations. According to program director, Chris Voss, "The aim is to develop the international manager rather than the domestic manager." This multicultural learning experience grows out of a need for international business expertise as national borders come down in the European community and around the world. (*Durham Herald Sun*, 6/23/91, p. B7)

Implications

To be competitive in a global economy, U.S. institutions of higher education must equip students to function in an international marketplace. Ideas and programs that will mushroom in the 21st century will include international scholars in residence, increased emphases on foreign languages and cultural studies, study abroad programs and other international cultural exchanges. It will be the unusual student who does not speak another language or who has not spent at least one semester ourside his or her country.

Recession forces colleges and universities to rethink roles

Federal and state budget cuts are not news to anyone in these days of tough economic times. Major universities are being forced to look at deficits in the millions of dollars over the next months. According to Anthony DePalma , Columbia University is currently laying out a strategy to meet deficits that in 1993 could reach $87 million. Stanford has initiated cuts up to 13% on academic and administrative expenses to trim its budget $43 million over the next two years. These are but two examples of institutions across the U.S. that face such severe budget problems, the effects of which will undoubtedly reach deep into classrooms and student services. (*New York Times*, 2/3/92)

> "Stanford has initiated cuts up to 13% on academic and administrative expenses to trim its budget $43 million over the next two years."

Implications

Significant tuition increases and cuts in financial aid are again on the horizon. How much can the consumer of higher education take when tuition at some of America's elite universities tops $20,000 a year? Tuitions at public institutions are also rising. Community college enrollments will continue to soar in these times of tight pocketbooks.

Budget reduction forces administrators to re-examine institutional missions. They are reconsidering concepts such as "academic excellence" and "quality education." Some leaders in the higher education community have indicated that the 20th century research university, as we know it, will cease to exist. New paradigms for higher education are being conceived, based on the rapid changes that are occurring in our country and in our world. Surviving in the world of higher education in the coming decades will take proactive, creative leaders who can identify signals of change and plan for an uncertain future.

Japan Colonizing U.S. Industries

The *zaibatsu* refers to cliques of interlocking Japanese banks and companies dating back to the late 19th century. Today, forming economic groups bound by interdependencies has become a way of thinking and behaving that is institutionalized in Japan, and accounts for 27% of Japan's assets and 25% of its sales. The clannish *zaibatsu* mentality gives the pattern of Japanese investment in America its unique vitality and form, whereby banks make low-cost capital available to sister companies for the long-term investment needed to create market domination. Investment in vertically integrated enterprises is becoming a key factor in strategic sectors of the U.S. economy (e.g., Toyota produces 200,000 cars a year in its Kentucky plant through a network of Japanese-owned suppliers). Robert Kerns says, "This is not a conspiracy. It's the natural extension of Japan's indigenous form of economic growth as Japan's economy takes on new global proportions." To a degree *Zaibatsu*

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America can be likened to a giant leveraged-buyout of parts of the U.S. economy, financed by extravagant purchases of Japanese products. Kerns states, "It is not far-fetched to image a time when Japan's powerful Ministry of Finance would have a direct input into U.S. economic policy and could openly influence its course. . . . It's only natural for a lender whose loans are growing, to demand a say in the way a corporation or a country's economy is run." On the positive side, Japanese investment is creating jobs, and Japanese management techniques challenge many U.S. firms to improve their operations. (Robert L. Kearns, *Zaibatsu America: How Japanese "Firms Are Colonizing Vital U.S. Industries,*. New York: the Free Press, 1992 as reported in *Future Survey*)

Implications

To face the *zaibatsu* monolith, the U.S. needs to increase the rate of saving, increase spending on R&D, improve education, cut the budget deficit and redefine national security in terms of broader economic and technological security. Research universities have the responsibility for continuing state-of-the-art research; all colleges and universities need to focus on preparing graduates to meet the needs of economic institutions under fire.

Japan as World Leader in 2015?

Rather than the Cold War and communism, America now faces a new challenge in the form of Japan's drive toward global technological and economic mastery. According to William S. Dietrich, President of Dietrich Industries, and holder of a Ph.D. in political science, the Japanese are winning the contest. Japan has uncontested dominance in every leading-edge industry; its GNP is twice that of the U.S., and per capita GNP is four times ours; Japan is the world's financial center of the new world economy; second-tier nations are those in East Asia with economies closely linked to Japan; third-tier nations include the US and EC as buyers of East Asian high-tech products; Japan owns over 40% of U.S. manufacturing assets, holds 50% of U.S. bank assets, controls a considerable amount of basic and applied research, and has amassed extensive media holdings in the U.S.

The causes of the U.S. economic decline are system-wide managerial, financial, and political shortcomings. Specifically, American political institutions include an anti-statist tradition (unlike Japan, Germany and France). Moreover, there are long-standing adversarial relations between labor/management/government, an explosion in liability awards, government of transients and amateurs, and the democratic deadlock in formulating national policy. To Dietrich, the U.S. can meet Japan's challenge only by adopting an American version of Japanese industrial policy with a strong central state and a top professional bureaucracy. (William S. Dietrich, *In the Shadow of the Rising Sun: the Political Roots of American Economic Decline*. University Park, PA: Penn State Press, 1991, as reported in *Future Survey*.)

Implications

U.S. colleges and universities face the challenge of producing graduates who can assist American businesses to compete in a global economy. A shift in curriculum to include emphases in languages, non-Western history, and area studies is essential to this task. Also needed is a new commitment to study abroad programs.

The argument by Dietrich and others (e.g., Perot) implies that American colleges and universities must reemphasize their role in American industrial development or they will encourage alternative educational programs outside the establishment that more specifically address the needs of American industry.

Raising Productivity in Services

Peter Drucker argues that "The single greatest challenge facing managers in the developed countries of the world is to raise the productivity of knowledge and service workers." For the last 120 years productivity in making and moving things has expanded 45-fold. But these gains are unraveling because there are too few people employed in making and moving things for their productivity to be decisive. We need another productivity revolution. New technology will not by itself generate higher productivity. Increases in productivity can only come from "working smarter," (i.e., from defining the task to be done and from eliminating what does not need to be done). A major insurance company recently increased the productivity of its claims-settlement department fivefold by eliminating detailed checking on all but very large claims. Hospital nurses spend half their time in paperwork (doing what they are not paid to do), and college faculty spend many hours in largely useless committee meetings. Such splintered attention is more and more the norm in many organizations. To increase productivity in the service and information sectors, management must (1) define the task, concentrate work on it, and define performance; (2) build a partnership with service workers so that responsibility is built into every knowledge and service job regardless of level; and (3) acknowledge that knowledge and service workers learn most when they teach and develop their enterprise into a teaching institution. (Peter F. Drucker, *Harvard Business Review*, 69:6, Nov-Dec 1991, 69-79 as reported in *Future Survey*.)

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tutions. Corporate downsizing will accelerate while offering greater work responsibility, equity stakes, and reduction of bureaucracy. The need for a flexible work force, one that can quickly adapt to market changes, will be increasingly important as organizations become flatter (have fewer layers of management). Union membership will continue to decline. Alternative forms of employee representation, such as regulation and litigation, will continue to emerge.

ChangeDriver 4: The Information-Based Economy. Technological advances will continue. Mass customization will typify the '90s—from customized bicycles to software with object programming. Instructional technology will continue to enhance education as a teaching and learning aid. Concern about the scientific literacy of the population will continue to increase. The telephone will increasingly be used as the gateway to sophisticated communications services. Video, audio, and data transmission will increasingly be integrated into a single fiber optic telephone system. The mobile communications environment will continue to develop as portable phones, facsimile machines, beepers, satellites and computers make two-way, 24-hour accessibility anywhere in the world. The schism between info-rich and info-poor will continue to grow. Changing employment conditions and new technologies will continue to challenge workers. The erosion of individual privacy will continue to grow.

ChangeDriver 5: Globalization. Movement of products, capital, technology, information, and ideas around the world will continue at a record pace. The democratization of Eastern Europe and Russia and free trade agreements along with international investments in business and real estate around the world increasingly pull all nations into the global economy. However, economic and civil strife is likely to continue in the former Soviet Union and Eastern Europe, causing the inflow of foreign investment to remain small. Regional economic blocs will increase in number and in economic importance. International migration, both legal and illegal, will accelerate in the 1990s. Prosperity is increasingly dependent on trade with, and the economic well-being of other nations. Greater international competition for markets will continue. Global leadership in science and technology will determine economic leadership.

> *"Quality of life versus economic well-being will be a dilemma of the 1990s."*

ChangeDriver 6: Economic Restructuring. Large-scale economic transformation of American business brought about by global economic competition, deregulation, rapidly changing technologies, and diverse and changing consumer tastes will continue. Large firms will accelerate the downsizing of their management staffs. The formation of low-skill jobs rather than high-skill jobs will increase. The number of home-based workers will increase, as will workplace options such as satellite offices. Increasing numbers of immigrants will be highly skilled technological and scientific workers.

ChangeDriver 7: Personal and Environmental Health. Quality of life versus economic well-being will be a dilemma of the 1990s. We are increasingly concerned about air, water, and food quality. In the U.S., there is continued questioning of the quality of, and access to, the nation's health-care system. Health-care costs will accelerate the issue of cost sharing between employers and employees and will increase the probability of strikes over benefits offerings. The AIDS epidemic will become increasingly critical. Concern about substance abuse and in resolving the issue of long-term care provisions will continue. Alternative forms of health care delivery, such as holistic medicine and self-help groups, will continue to grow in popularity. With respect to the environment, the concern about the connection between energy types and use and environmental crises will increase, with corresponding demands on elected officials to focus on environmental issues. Finally, the economic consequences of global environmental climate change will receive increased attention.

ChangeDriver 8: Family and Home Redefined. There will be growing acceptance of nontraditional family groups. Men and women living having children out of marriage, single women having children by choice, gay and lesbian men and women having open relationships, and "friends" just living together are being accepted by courts, employers and society in general as "families." Many observers see the 1990s as a decade when Americans will return to the simple life, embracing home and family. The divorce rate is expected to decline. Multigenerational households and families will increase. Leisure time will continue to grow in importance. Home is being transformed into an office by more and more people (28% of the U.S. workforce works at home).

ChangeDriver 9: Rebirth of Social Activism. Americans are becoming more concerned about social issues. The ACE-UCLA annual survey of entering college freshmen found the highest level of involvement in social-action activities in history. The 1990s will be a decade of people wanting "community action" that produces results. Racial and ethnic ten-

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sion will remain high; violent crimes are expected to increase. The poverty rate is likely to increase as will the number of homeless Americans. There will be an increased recognition of the importance of children's physical and mental wellness—especially in relation to the provision of family support services—a recognition that will become integral to public education reform.

Implications

Funding for research in the following areas is likely to increase: gerontology; the roots of crime (poverty, substance abuse, etc.); AIDS education, treatment and prevention; and the efficacy of alternative forms of health-care delivery. Increasing attention will be given to curricular programs on multicultural education and programs to reduce racial and ethnic tensions, as well as continuing education programs for those wanting to start their own businesses. Curriculum committees will spend more time on reviewing graduate and undergraduate programs vis-`a-vis their relevance to preparing graduates to function in an increasingly multicultural, multilingual, and diverse workplace facing increasing global economic competition. Provosts will increase their efforts to train faculty in instructional technologies to enhance learning, including distance education. They will also take advantage of the growing interest among business, organized labor, and government to form partnerships. Advances in computer and telecommunications technologies will continue to offer the potential for improvements in administrative functions vis-`a-vis data collection, analysis, communication, and program assessment. We must do all of this with little increase in government funding.

Social $\Sigma\Sigma$

Increasing Adolescent Violence

Violence has replaced communicable diseases as the primary cause of death for American teens. Appalling statistics confirm an epidemic of violence that has no parallel in any other industrialized nation of the world. Nearly 80% of all teenage deaths are the result of violence—from homicides, suicides, motor vehicle crashes, and other unintentional injuries. And for the first time, firearm death rates for both white and black male teenagers exceed the total from all natural causes. The extent of this escalating national problem is evident from statistics:

Teenage homicides—up 300% in the last thirty years.

Suicide rate for 15 to 19 year olds—tripled to 10 per 100,000 in the past thirty years.

Firearm death rate for 15 to 19 year olds—up 43% between 1984 and 1988. (*Emerging Issues*, 1992, as reported in *Happenings*)

Implications

If present trends continue, American schools and colleges and universities will be increasingly unsafe. More resources will have to be allocated to campus security and to crime prevention. Personal security may become a major factor when students, especially women students, select their college. Time, money, and energy devoted to the problem of violence detracts from students receiving a quality education. Progressive campuses will declare themselves "gun-free" and find ways to restrict access of the outside community to campus events. Campus counseling centers will need additional trained staff to deal with victims of violent acts and to promote self-defense education.

Top Issue Facing the Nation

A poll conducted by The Roper Organization found that 83 percent of Americans think that drug use was the most serious problem facing America in 1991. (*What Lies Ahead*, 1992)

Implications

In the 1980's we have witnessed many colleges and universities hosting proactive drug and alcohol awareness seminars and symposia. It is essential, however, to step up prevention and education programs and to continue to investigate the use of state-of-the-art treatment methods on campus. It is important for higher education institutions to widen the scope of drug and alcohol prevention and treatment programs to include faculty and staff as well as students.

Middle Class "Pulling Apart" to Rich, Poor

A Census Bureau report released in mid-February, *Trends in Relative Income: 1964 to 1989*, provided further evidence that the nation's middle class has shrunk since 1969, while the proportion of Americans with high and low incomes has grown.

Using for the first time a "relative income" measure that takes family size into consideration, the Bureau reported that the percentage of persons with middle income fell from 71.2% in 1969 to 63.3% in 1989. In '89, median income for a

family of four was $27,153. A family of four with an income below $18,576 was considered low, whereas a familty of four with an income of att least $74,304 was considered high.

The growing income inequality stems from several causes, including the increase in female-headed families, which are much more likely to live in poverty. Another cause is the increasing gap in wages, with more workers earning low wages at the same time highly skilled workers have made income gains.

The Census Bureau report also compared people by educational attainment. It found the biggest increase in poverty was among people without a high school education — from 21.7% in '69 to 38% in '89.

On the other hand, college graduates were the only educational group whose proportion of high income earners rose from 37.4% in '69 to 40.4% in '89. (Census Bureau 2/92)

Implications

The shrinkage of the middle class has meant that more children are living in poverty, increasing from 19.4% in '69 to 29.1% in '89. This is largely a result of increases in the number of female-headed households, but the number of kids living with both parents in a poverty situation has also risen. As with all bad economic news, this increases the demand for human services. As the percentage of children in poverty increases, the split between those with the resources to attend college and those without those resources widens. Increasingly the United States moves to a two-tiered educational system based on economic status and not ability. Community colleges should benefit at the expense of public and independent four-year colleges. Advocates of social justice may not tolerate such a two-tiered system and will force government to increase Federal support for low-income students. This move would benefit higher education; however, government may also implement cost-cutting measures such as capping tuition rates, salaries, and overhead and other expenses. Legislating costs may limit the quality, size and variety of programs offered and place publicly funded institutions in a weak position to compete with privately funded institutions for talented students.

Home and Not Alone

In the late 1970s, only 10,000 or so children were being taught exclusively by their parents at home. Today that figure has grown to over 250,000. Home schooling has gained in popularity among parents who believe traditional classrooms fail to teach values.

Most parents have religious motives for "home schooling" their kids. But home schooling appeals across religious and ideological boundaries, says Pat Lines, a Catholic University professor who researches home schooling for the U.S. Department of Education. Home schooling families come from all social classes, and almost always it is the mother who does the teaching. A desire to spend more time with their kids is a common reason a parent chooses home schooling, says Lines. Or, she says, "antibureaucratic views" may be behind the decision.

Indeed, home schooling can be considered the ultimate in school choice. It affords parents an unparalleled flexibility. They determine values, curriculum, and even school hours.

Critics, including the National Education Association and some psychiatrists, maintain that children who are schooled at home suffer academically and socially. University of Chicago child psychiatrist Bennet Leventhal says the children do not "learn to deal with bad and sordid things" that regular students encounter.

Home schooling growth has even spawned new businesses: firms that provide workbooks, textbooks, and lesson plans. Some provide counseling for parents who need help with the curriculum and others grade students' work and keep records.

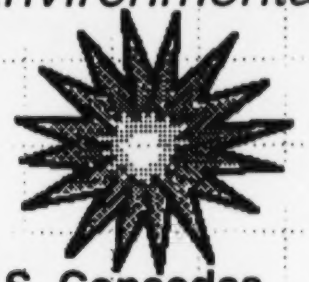
> "Perhaps our schools of education should . . . explore special programs for 'home instructors.'"

In 1982 only two states had laws guaranteeing the rights of home schoolers, now 34 states have passed such laws. (*Insight*, 12/2/91 as reported in *Happenings*)

Implications

Perhaps our schools of education should in conjunction with their continuing education centers explore special programs for "home instructors." Research is needed on how "home schooled" students do when they enter institutions of higher education. Security and "campus culture" issues are likely to be important factors for college selection by home-schooled students.

Environmental



U.S. Concedes Anti-Warming Measures

The United States recently agreed to reduce its carbon dioxide emissions and donate $75 million to help developing countries do the same. These concessions are part of negotiations toward an international agreement to help stall global warming, held at the United Nations in February of this year. It is hoped that the U.S. will join other nations in signing an international agreement in June at the United Nations Conference on Environment and Development, to be held in Rio de Janeiro, Brazil.

Particularly, the U.S. agreed to reduce its own emissions of greenhouse gases by:

1. Improving energy efficiency by raising standards for buildings and appliances.

2. Encouraging the use of vehicles that run on alternative fuels, the use of public transportation, and research on electric cars.

3. Supporting research on more efficient aircraft and trains, new methods of energy generation, and encouraging industrial waste reduction and recycling.

Implications

Updated environmental measures will affect colleges and universities most directly through their physical plants and equipment holdings. New standards for buildings and appliances will be costly as administrators work toward compliance. Recycling, which has begun in many pilot programs on campuses, will most likely be institutionalized, coordinated, and regulated. On the horizon, institutions of higher education will be hiring officers to oversee environmental affairs.

The Emerging Energy-Environment Crisis

The Gulf War highlighted the connection between energy and the environment. It left hundreds of oil wells burning out of control, sending clouds of particulates and acid rain as far as southern China and the Soviet Union. It also produced the worst oil spill in history.

A less spectacular but far more pervasive energy-environment crisis is emerging, one that may eventually make Gulf War environmental damage seem minor. This emerging crisis is caused by the use of oil and other fossil fuels. It is not a crisis of high energy prices, but one of low prices encouraging wasteful consumption and discouraging investments in energy efficiency and alternative energy sources. The environmental consequences include deteriorating urban air quality, acidification of lakes and forests, crop losses, and global climate change. *What Lies Ahead: A Decade of Decision*, United Way of America, 1992, p. 89)

Implications

In the next decade and beyond, higher education administrators will be challenged with making energy usage decisions for their facilities based on environmental concerns in addition to cost related issues. Moreover, leaders in higher education will be held accountable for how their decisions affect the environment and will be especially how they will preserve natural resources. Perhaps universities and colleges will become the testing grounds for the efficiency of and the environmental soundness of renewable energy sources. University research projects on the ozone, particulates, and acid deposition are expected to increase.

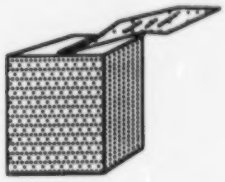
"A less spectacular but far more pervasive energy-environment crisis is emerging, one that may eventually make Gulf War environmental damage seem minor"

Economics, from p.4

Implications

American college and university administrators will need to take the lead in drawing their academic community into dialogue to address ways to work together and to work smarter. Progressive institutions will find ways to integrate principles of Total Quality Management and similar programs into their organizational culture.

Political



National Program Approved to Support Overseas Study

Legislation introduced by Senator David L. Boren (Dem., OK), the National Security Education Act of 1991, passed both houses of Congress late in 1991. Enacting this bill will increase opportunities for undergraduates to study abroad, and will support the training of language and area studies specialists.

The idea for this program emerged in part from a desire to provide the federal intelligence and security agencies with a robust pool of experts on critical regions and languages around the world. The legislation was criticized, however, for its suggested link between the intelligence agencies, students, and universities. Boren stated that a governing board would be responsible for the program's independence and its integrity. He said that the bill included "an express prohibition on the use of these students for any intelligence-gathering activities."

This program is the most significant education initiative of its kind since the National Defense Education Act of 1958. The Boren Bill authorizes a new international education trust fund of $150 million, the income from which will finance overseas scholarships for undergraduates and fellowships for graduate students. According to *The Chronicle of Higher Education*, the legislation will triple the amount of federal dollars now being spent on undergraduate study abroad, and will increase by 40 percent the funds available for graduate language and area studies. Boren indicated that there is a goal of having the first grants available to students by the fall of 1992. (*The Chronicle of Higher Education*, December 4, 1991, p. A55.)

Implications

This legislation will enable many more U.S. students to travel abroad for study. Moreover, implementing the program will allow lower and middle income students to participate in cross-cultural, international education. Humphrey Tonkin, president of the University of Hartford and chairman of the Council for the International Exchange of Scholars, indicated that staggering low numbers of minorities have participated in past study abroad programs. Additionally, fewer than one percent of U.S. undergraduates study in foreign countries. This program, then, will be a step toward equipping students with the cultural and linguistic expertise to compete effectively in the new international environment. U.S. higher education administrators and faculty will have the opportunity to place a new focus on study abroad and will be able to direct students toward new resources to finance international higher education.

U.S. Supreme Court Applies Sex Bias Law to Schools

A surprising, unanimous, February 26th (1992) Supreme Court ruling could set in motion untold numbers of law suits by women and girls who claim that they have been victims of gender bias in school programs—including athletics. This decision follows the 1972, Title IX law that bars gender discrimination at any education program that receives federal aid. This ruling means that bias victims, including female football players and male cheerleaders, can bring suit against institutions for unlimited monetary damages, rather than just call for a change in biased behaviors. This decision is contrary to the Bush administration position, which contends that the law does not permit monetary damages. (*USA Today*, 2/27/92)

Implications

Lawsuits charging gender, race, or religious discrimination against institutions for monetary damages add a new dimension to an increasing litigious society. Colleges and universities will have to go beyond equal opportunity hiring and team building to be prepared to pay damages to any individual who can prove a case of bias. Increased legal fees, damage awards, and liability insurance could prove to be quite costly for institutions of higher education in the future.

Pork-barrel Science

The increased moneies set aside by Congress for research projects at specific colleges and universities have critics decrying "pork-barrel science". Such moneys are channeled directly to colleges and bypass the normal competitive review process. The amount has more than doubled from the $225 earmarked in 1988. In 1991, $491 million was allocated for these types of projects. Institutions in five states (West Virginia, Massachusetts, Pennsylvania, Louisiana, Michigan) got 35% of the earmarked funds. (*The Arizona Republic*, 4/12/92)

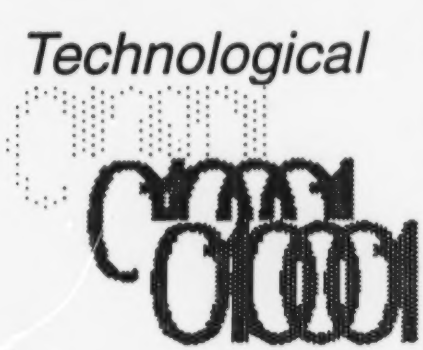
Implications

The public's awareness of institutions of higher education participating in what many would view as a questionable practice will contribute to the continued decline in the respect of the public towards higher education as a social insti-

Political, p.10

Political, from p.9

tution. Such loss of respect among the general public could diminish the credibility and the intellectual and moral leadership of American higher education as a social institution during a decade when the public has few sectors of society or social institutions to look up to. [See Bellah, Madsen, Sullivan, Swidler, and Tipton's *The Good Society* (1991, Knopf) for a discussion of the role and responsibility of our social institutions, including education, in addressing the problems of contemporary American democracy].



Publication Goes Electronic

A new electronic journal, *Current Clinical Trials*, will contain results of research on new and established medical treatments for diseases. The technology used to transmit the journal was developed by the Online Computer Library Center, a partner in the venture.

Speed is one great advantage of electronic publishing. The elimination of the printing process and mailing time will reduce the time it takes for readers to get valuable information (a reduction of two months). Another advantage of the electronic journal is the user's capacity to customize the format of the electronic system. For example, a reader can specify what information one is interested in on a regular basis, and whether one wants to view tables side by side with text or whether to set them aside for later use.

Initially, the new journal will be available on IBM desktop and compatible computers, for a subscription cost of $110 a year. The availability of the publication on Apple Macintosh computers is expected by 1993. Libraries will be able to receive the journal on microfiche, as well. Users will be able to search the data base by key words, subjects, authors, or titles. The new journal will publish research 24 hours a day, with user availability 14 hours a day, with the exception of Sunday. Each time users sign on, the system will alert them to material published since the last time they used the program. (*The Chronicle of Higher Education*, 10/2/91).

Implications

With the increasing cost of journals in print and the anticipated reduced cost of electronic publications, great changes in information science for colleges and universities are on the horizon. The university of the future may consist of much less paper, and more personal computer work stations. The library may be accessed electronically. Students, faculty, and college staffs of the future will be able to send and to receive information from their desk tops. As electronic communication increases, institutional boundaries break down. Interinstitutional collaboration becomes the norm. Research projects have the potential to increase in scope and in applicability due to multi-inputs from different points of view. The world moves closer to a global community concept where students and professors have international contacts who can update them on global events at a moment's notice.

High-Tech Happenings

Although high technology in education has not entered the mainstream the way it has elsewhere, many experts contend that it will in the next decade. The following is a sampler of what is new in educational technology.

CD-I (Compact Disc-Interactive): Looks like a music CD, but contains movies and animation with which users can interact.

DVI (Digital Video Interactive): With these programs, students can call up a photograph, zoom in on an object, and pan the area to manipulate objects.

Graphing calculators help users to visualize numeric formulas through graphic readouts.

MBL (microcomputer-based laboratory): Plugs into the back of a microcomputer and transforms it into a sophisticated laboratory. A sensory probe can measure temperature, light, sound, or motion. (*Agenda*, Fall 1991)

Implications

The university of the 21st century will not resemble higher education as we have known it to date. Potentially, there will be less paper, less human interaction, and an electronic information explosion. Options for off-site learning will increase as new telecommunication devices become common place. Two-way satellite communications will enable learning to occur between institutions in this country and around the globe.

the environmental scanning newsletter
for leaders in higher education

on the horizon

October, 1992
Volume 1, Number 1

Editor's Column

WELCOME TO VOLUME ONE, NUMBER ONE!

The purpose of *On the Horizon* is to alert members of the higher education community to driving forces and potential developments in the macroenvironment that constitute threats or opportunities to colleges and universities. We do this by reporting news from the social, technological, economic, environmental, and political (STEEP) sectors, local through global levels. And we suggest the implications of these developments or potential developments for higher education. Members of our editorial board will write pieces on developments they see on (or perhaps beyond) the horizon that could affect your work and future in higher education and will speculate on the implications these developments have for colleges and universities. You may not always agree with what they say, but we hope you will agree that their articles stimulate your thinking. (And what better way to begin than with George Keller's piece in the next column!)

We want to be of service to you. As you will note in this issue, we have a section called *Tools*, written by our managing editor, Bernard Glassman, an information consultant with expertise in software for both DOS and Macintosh computers. In subsequent issues we will add other sections. The *Issues* section will focus on critical issues facing higher education. *Using Scanning Information* will illustrate how some colleges and

Editorial, p.2

What's on the Horizon for Higher Education?

by George Keller

In the late 1990s higher education management will be even more difficult and intractable. Why? Because colleges and universities face not only little changes but tectonic shifts in the geology of society.

I think three shifts will probably be especially consequential. I will describe the three briefly, point to how they might affect college life and structures, and suggest a few things education leaders might do.

Shift No. 1: The Socio-economic Realignment

The United States has long been regarded as a middle-class nation. But in the past 20 years, the middle-income group has been dwindling while the numbers of poor and upper middle-class persons have been increasing.[1] Education levels, family life, and values have been dividing the nation into haves and have-nots. College graduates have been marrying other college graduates, and with hard work, self-confidence and self-discipline have been building two-income families, have been having none, or one, or just two children. At the other end, young people have been dropping out of high school, having children out of wedlock—27% of all U.S. babies last year were born out wedlock—and having difficulty finding jobs, turning to drugs and crime, and being forced to compete with low-cost labor in foreign countries. This socio-economic shift is creating new culture patterns, political alignments, and higher (and lower) education demands.[2]

The shift is also polarizing higher education, as some institutions serve the ambitious, well-off, and educationally advanced while others, particularly community colleges, tend to serve the wary, poor, and educationally underprepared. Within many institutions three discrete faculties have come into being: one for remedial or developmental studies, one for traditional higher education, and one for adult and continuing education. Only one of these faculties is open to tenure and allowed a seat on the faculty senate. Half of all college math courses are now remedial, and fewer than 40% of U.S. high school students are in the college preparatory track. But the most prestigious colleges continue to be in high demand and conduct research.

Education leaders will need to think more socio-ecologically in the years ahead, decide on what constituencies they will serve, and how they will restructure to educate a less homogeneous youth population. For example, four years of undergraduate life may be reserved for less qualified students while three years becomes a standard for the eager and better prepared. Remedial programs and adult continuing education programs may run 12 months a year, as many already do, with only traditional programs continuing in the leisurely eight-month calendar.

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Editorial, from p.1

universities use scanning information in academic or institutional planning. *Book Reviews* will bring to our attention those new books that will assist us anticipate the future. *Letters to the Editor* will offer you the opportunity to respond directly to items or to their implications in case you disagree with our assessments or wish to add to them.

You are invited to participate in all sections of this newsletter. In fact, the sections on *Issues*, *Letters*, and *Using Scanning Information* depend upon your input. We welcome items that serve as signals of change in any of the STEEP sectors. Please also provide a statement of the implications of these signals for higher education. If we use your contribution, we will give you credit for its submission.

A final note. We are thinking of two additional services we may offer. One would be a site license to copy and distribute *On the Horizon* to your colleagues as a regular function of your office. The other is to publish periodically our scanning database in electronic form in a text or bibliographic data base format for both DOS and Macintosh computers. This growing data base consists of abstracts of books and articles and their implications for colleges and universities. Please let me know if you would be interested in either service. (Phone, mail and internet information is on the masthead.)

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Shift No. 2: Technology and Internationalism

Communications technology will increasingly allow students and faculty to talk to each other across the country and with persons in most other countries. Portable phones, electronic mail, facsimile machines, computers with modems, satellite transmission, interactive video, and other devices mean the place-bound campus is less and less central. Distance learning should increase.

The communications advances will continue to permit more international exchanges. And since United States universities are perceived as educationally strong, technologically advanced, and intellectually free, U.S. higher education should enjoy swelling foreign student enrollments. Since the USA also takes in more immigrants annually than all other countries combined, student—and faculty—representation will diversify further.

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Turning swords into plowshares

"Defense conversion" once meant turning missile plants into factories, but this year it has taken on a much broader meaning that encompasses an overall plan for restructuring the economy and the nation's defense. Proposals range from broad spending packages targeted at creating new jobs and assisting hard-hit communities and workers, to trimming taxes and opposing calls for deeper Pentagon cuts. According to Senator Phil Gramm, what we're experiencing is the beginning of a new debate that will continue through the next decade: What do we do with all the money we used to spend on defense? The House's fiscal 1993 budget resolution, approved March 5, includes spending up to $6.6 billion for conversion projects such as community development, worker retraining and research aid, and more spending on housing and transportation. [Fessler, P. (1992). Hill struggles to assist victims of post-cold war budget cuts. *CQ*, 50(10), 542-545.]

Implications

The debate over using the peace dividend exists because there are so many competing objectives (reduce taxes, reduce deficit, rebuild the nation's infrastructure, attend to social and educational needs, repair the environment, and jumpstart the economy). However, higher education has an opportunity to generate integrative/collaborative solutions with governmental agencies and corporations, and therefore provide a service to society as well as obtain additional funding support.

Government Controls at Local Levels

For a decade, the federal government has been shifting responsibility for spending programs from Washington to the states. But now that the states are encountering budget crunches of their own, they are passing the buck to counties and local municipalities. The greatest budget-shifting experiment occurred in California, where Governor Pete Wilson and the Democratic legislature shifted more than $2 billion in welfare, mental health and medical programs from the state to the counties. State mandates now account for 60 cents out of every county budget dollar in New York State. Last year, at least 14 states imposed new mandates on local government, mostly in employee pension programs, health, and environment. [Shribman, D. (1991, September 3). More states, taking a leaf from Federal book, pass on their spending programs to localities. *The Wall Street Journal*, p. A20.]

. . . higher education has an opportunity to generate integrative/collaborative solutions with governmental agencies and corporations, and therefore provide a service to society and obtain additional support.

Some states have shifted to counties responsibilities for programs such as special education, clean water, health and welfare services, corrections, and landfill reclamation. One result of this is that the 443 largest counties in the US have shortfalls that average $8.3 million. According to a recent survey by the National Association of Counties, the dilemma is that counties have typically far less leeway than either states or Washington to enrich their coffers. Some officials are petitioning their state legislatures to approve new fees for county services. [Crisis in the counties. (1991, September 24). *The Christian Science Monitor*, p. 20]

A wave of new taxes and tax increases, the third since the 1930s, is developing in states, counties, and cities to finance social services. This can be seen in three states considering income taxes who have traditionally opposed the income tax (Connecticut, Tennessee, and Texas). In contrast to the 1960s and 70s, states, counties, cities, and towns, rather than the federal government are now absorbing most of the rising costs of public health care, education, prisons, waste disposal, and other public works. This transfer has produced what University of Pennsylvania economist, Alan Auerbach, and others call "a new federalism." [Uchitelle, L. (1991, March 25). States and cities are pushing hard for higher taxes. *The New York Times*, p. A1, D6.]

Implications

Shifting the responsibility for social service programs to local government aggravates the segregation of the "haves" and the "have-nots." Avoiding an undue tax burden, individuals with incomes leave areas with a higher than normal

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Economics, from p.3

percentage of "have-nots." The end result is the "haves" living with the "haves" and sharing a low tax liability, while the "have-nots" live together with minimal access to social programs. Two solutions are possible. One is to broaden the tax base by shifting the spending responsibility back to the state level. The second is to establish "economic development zones" within these disadvantaged areas to stimulate entrepreneurial activity and, thereby, generate income. An important factor for the success of the "economic development zones" is technical training of these disadvantaged workers. Thus the economic development zone concept provides new opportunities for community colleges and technical school recruitment and program development.

The overwhelming majority of financial support for higher education comes from state and local taxes and from tuition. As the pressure on state and local tax dollars increases, so will the pressure on higher education to justify its share of those dollars.

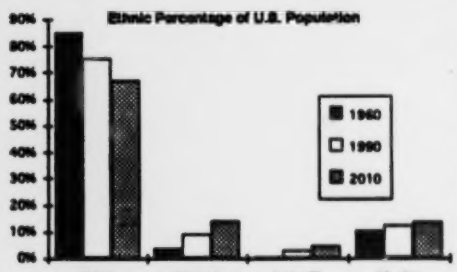
The Cultural Mosaic

Immigration is a significant contributor to population growth and ethnic diversity in America. The national census revealed that about 127 million, or 51% of 1990's population is attributable to the net immigration of 48 million persons during the period 1790-1990. About 98 million of these are attributable to the immigration of 28 million, primarily from Europe, during the period 1830-1930.

Major changes in the ethnic composition of the American population have reflected immigration patterns. Thus, the percentage of whites rose from 81% in 1790 to 90% in 1930 and the African American percentage dropped from 19% to 10% during the same period.

The thirty year period from 1960 to 1990, however, reflected the most pronounced changes in ethnic composition (based on major racial groups and those of Hispanic origin) in all the censuses from 1790-1990. The total white percentage in this period dropped from 89% to 84%; whites of non-Hispanic origin dropped from 85% in 1960 to 76% in 1990. Correlatively, minority groups all increased their proportions. The Hispanic population percentage rose from 3.5 to 9.0. During the same period, the Asian and Pacific Islander population rose from 0.6% to 2.9%. These figures reflect a large scale immigration pattern from Latin America and Asia. Furthermore, the growth rate of the Hispanic and major non-white racial groups was higher than that of the total population. The African American population during the 1960-90 span also increased, from 10.5% to 12.1%, due to a higher growth rate than that of the white population, though lower than the rate of the other minority groups.

By 2000, Hispanics are expected to increase to 9.4% of the total population, when they will number 25.2 million. By 2010, it is expected that the number of Hispanic Americans will reach 40 million, thus slightly outnumbering African Americans in the U.S. population. Asians and Pacific Islanders (PI) are the fastest growing minority in the U.S. with a 108.5% increase between 1980 and 1990. Only 2.9% of the U.S. population and numbering around 7.3 million in 1990, the Asian and PI segments are forecast to rise to 3.5% of the population, or 9.5 million persons, by 2000. By 2010, they will number 12 million, or 4.5% of the total population.



African Americans are expected to reach 35.1 million by 2000 and represent 13.1% of the nation's population. By 2010 they will number 38.8 million or 13.7% of the total population. American Indians (including Eskimos and Aleuts), numbering almost 2 million, made up less than 1% of the U.S. population in 1990. [*What lies ahead: A decade of decision*. (1992). Alexandria, Virginia: United Way Strategic Institute, pp. 12-13. and Gibson, C. (1992). The contribution of immigration to the growth and ethnic diversity of the American population. In *Proceedings of the American Philosophical Society*, 2, 157-174.]

Implications

These figures and projections give substance to the notion that we are increasingly a multicultural society. Many programs started in the past few decades have been aimed at increasing the number of minorities in colleges and universities. The number of minority students increased dramatically in the 1970s, but slowed significantly in the 1980s, with Asian-Americans as the only group showing continued rapid growth. Minorities in graduate school have shown a dramatic decline in growth. According to Altbach and Lomotey (*The Racial Crisis in American Higher Education*, Albany NY: State University of New York Press, 1991), there has been resistance by departments and programs to affirmative action guidelines, and a serious problem of a pool of racial minority candidates for many fields. Af-

Social, p.5

Keller, from p.2

Communications technology and internationalism will force new structures of administrative leadership (communications and computer czars and international operations vice presidents) and of programming. It means that higher education will become more capital-intensive and more connected with other colleges, and that pedagogy in the classrooms will change appreciably.

"Colleges will be pressed to reduce the . . . number of courses they teach, increase teaching loads for professors who do little research, reduce administrative oversight, charge for student services . . . "

Shift No. 3: Finances and Productivity.

In the past dozen years higher education costs have been rising about 20% faster than the Consumer Price Index, resulting in extraordinary tuition increases and relentless capital campaigns.[3]

Meanwhile, U.S. family real income has scarcely increased since the 1970's, and the ability of states and the federal government to increase aid to higher education to meet escalating college costs have been declining. America's aging society—the elderly now consume one-third of all tax dollars—and increased international economic competition will limit further government support for universities.

The combination of runaway costs of institutions and the decreasing ability of families and governments to finance them will compel a new emphasis on productivity on campus and changes in the delivery system of higher learning. Colleges will be pressed to reduce the huge number of courses they teach, increase teaching loads for professors who do little research, reduce administrative oversight, charge for student services, and introduce other economies. The microeconomics of higher education institutions will be a new area of study. Administrations will need to restructure their operations to trim costs, and intensify fund-raising and locate new revenue sources.

[1]Frank Levey, *Dollars and Dreams: The Changing American Income Distribution* (New York: Russell Sage Foundation, 1987); "Paying for College: A New Look at Family Income Trends," *College Board Review*, 152 (Summer 1989), 18-21, 32-33; Kevin Phillips, *The Politics of Rich and Poor* (New York: Random House, 1990).

[2]See, for example, Ronald Inglehart, *Culture Shift in Advanced Industrial Society* (Princeton: Princeton University Press, 1990).

[3]Arthur Hauptman, "Why Are College Costs Rising?" *College Board Review*, 152 (Summer 1989), 11-17, 32; Michael McPherson, Morton Schapiro, and Gordon Winston, "Recent Trends in U.S. Higher Education Costs and Prices," *AEA Papers and Proceedings*, 79 (May 1989), 253-257; Charles Clotfelder, Ronald Ehrenburg, Malcolm Getz, and John Siegfried, *Economic Challenges to Higher Education* (Chicago: University of Chicago Press, 1991).

Social, from p.4

rican Americans and Hispanics remain seriously under-represented at the most prestigious colleges and universities. In effect, although the U.S. will continue to be more ethnically diverse, the pool of minority Ph.Ds will continue to decrease.

Altbach and Lomotey point out that the bulk of student activism is related to racial issues (either South Africa and its racial policies, or on-campus racial incidents), and that race remains one of the most volatile and divisive issues in U.S. higher education. If racism is to be tackled successfully, the initiative must come from the top in addressing such issues an enrollments, faculty recruitment, curriculum, minority student alienation and attrition, and faculty-student relations.

There is another challenge here—educational leaders must take advantage of diversity to increase competitive strength in a changing world. They can do this by incorporating multicultural concerns in the curricula, and by actively recruiting students, faculty and staff that represent this diversity. And they must be prepared to handle the controversy engendered by attempts to diversify the existing curriculum.

While it is important to address multicultural issues through revising the curriculum and actively recruiting minority faculty, staff, and students, it is also important to address some of the subtler aspects of the problem. Valuing difference does not simply arise from exposure to diverse models and curriculum. It grows slowly as a result of associating and interacting with people with different perspectives. Higher education must find ways of facilitating such opportunities that might not normally occur, given the natural tendency of people to associate with what is familiar and easily understood.

Our Aging Society

The number of elderly people in the U.S. continues to increase. In 1990, 12.6%

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Tools

Bernard Glassman

This regular column will review computer software, hardware and services of interest to the environmental scanner. Its opinions will be as subjective and arbitrary as those of any busy user, and it will evaluate from the perspective of the person who needs results quickly. I will provide information about manufacturers and publishers, (who are always willing to send you reprints of sophisticated, patient, indepth technical reviews by computer junkies,) along with pricing information. If special discounts are available for educators, I'll include them.

CoWorks Time Series Library

Price: Commercial, $395 for software and basic data library with 3 quarterly data updates

Academic, $295 for software and basic data library with 3 quarterly data updates

Additional years of updates are $195 and $145 respectively each year. Numerous special optional data sets are planned.

From: CoWorks Corp. 1020 Central, Kansas City, MO 64105 (816) 421 1548

Needs: IBM or compatible, Lotus 1-2-3 2.01 or higher (or Quattro Pro) and 5MB of hard drive space. Best tested configuration is version 3 of Lotus 1-2-3 or Quattro Pro 4.0. May run on the Macintosh (see below.)

Edward Tufte writes in *The Visual Display of Quantitative Information*, ". . . statistical graphics, just like statistical calculations, are only as good as what goes into them. An ill-specified or preposterous model or a puny data set cannot be rescued by a graphic (or by a calculation), no matter how clever or fancy. A silly theory means a silly graphic." Tufte illustrates his point with a time series graph tracing 1929's New York and London stock prices, along with solar radiation (inverted) for the same year. Each curve drops slowly as it approaches June, rises precipitously toward September, then plummets into December. The naive inference is that there must be some sort of connection among the three. The equally naive inference is that there are not only lies, damned lies and statistics, but that even further along the spectrum of mendacity there are statistical graphics. That can be true, but it need not be.

How nice it would be if our statistical graphics software could issue a warning like "Although these curves are superficially similar, the viewer should not only doubt that one phenomenon is the cause of the other, but should also refrain from concluding that they have anything to do with one another whatsoever." That would truly be a graph with added dimension.

Although CoWorks' Time Series Library issues no such caveats, its manual is disarmingly candid about the software's potential for abuse. "WARNING," says the page on moving correlation, "Correlation is only an estimate of the mathematical coincidence of change. It is not a measure of cause and effect. To make cause and effect judgments, you must understand the raw data and consider whether a mathematical coincidence of change can be interpreted as a cause and effect relationship."

CoWorks is an electronic publisher, specializing in finding, compiling, editing and publishing machine-readable information. Their first venture, The Time Series Library, is not a stand-alone program, but a large number of time series, along with a masterly Lotus 1-2-3 worksheet that allows you to step systematically through the creation of graphs from the data supplied by CoWorks or by other sources, such as your business school, accounting department, department of geography, development office or other collectors of numbers. The program comes with Foundation Pack, a generous supply of time series (550 in all) ranging from a century and a half of GNP to annual figures for high school and college graduations. Some measures are annual, others are quarterly. Each series includes some descriptive information, along with definitions, collection methods, and a brief bibliography. All series are at national, global/regional or world levels; if you want state figures, CoWorks can develop them for you on a custom basis. But if you want to track annual changes in the size of the Nigerian labor force against the same statistic for seven other nations, the stock of foreign-owned capital in the U.S. since 1869 or the stock of U.S.-owned capital abroad since the same year, the data are there.

For the U.S., data sets are, as might be expected, the most varied, and are grouped into such categories as Agriculture, Business, Construction, Environment, Financial Markets, Government, International Trade, Labor, National Income, Population, Science and Technology, and Social Indicators, the last of which includes education statistics. As you might expect, the preponderance are from federal sources.

The manual is as clear as one can hope for, given the vagaries of Lotus 1-2-3 and the DOS system with which it was designed to work. There is a nice mixture of how-to with why-you-might-want-to, and a rather interesting treatise on the mathematics of time series. (There is the to-be-expected use of "data" as though the word were incapable of being plural, but if that is a serious problem for you, you may as well stop reading manuals.) Included is a complete 11" by 17" map of all the layers of menus, sub-menus, sub-sub-menus, etc., etc. that you get to use to accomplish various tasks. Nearly every layer of menus offers access to on-screen help with the currently available menu options. If you are still confused, you can always call the company. I have spoken with the CoWorks staff on several occasions, in the capacity of user rather than reviewer. They have been supremely patient and polite. There is no cost for technical support.

Is the software easy to use? If you are accustomed to the generally paint-by-numbers feel of the more popular 'user-friendly' pre-Windows programs on the IBM and compatibles (WordPerfect, Harvard Graphics and the like), the answer is yes. It's a lot easier than trying to do the same thing with Lotus 1-2-3 alone. If you are already facile with Excel for Windows, with CA Cricket Graph, or if you have been using almost any software at all on a Macintosh, the CoWorks program may feel frustratingly clunky and awkward. However, if you are a Macintosh user, or if you have the good luck to be using Quattro Pro 4.0 (QP 4.0) under Windows or OS/2, you may still be in luck. As of this writing, the folks at CoWorks hadn't tested their program with

Tools p 7

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Lotus 1-2-3 for the Mac. I'll try to test it myself, and will let you know in our next issue. (I'll ask our consulting Quattro Pro guru to do the same with QP 4.0.)

Time Series Library produces graphs that are about as far as possible from the flashy three-dimensional, shaded-background wonders that so many spreadsheets and slidemaking programs can create, a limitation that many graphing purists (including, no doubt, Tufte himself) will applaud on grounds that the flashier the graph the more misleading it can be. So, if you use the CoWorks system and jaws drop when their owners see your graphs, it will be caused by the brilliance of your observations and not by the connect-the-dots manner in which those observations are illustrated. However, even if you never use the worksheet, the data may be worth the $300 to $400 outlay. You can use them with other spreadsheet and database programs. It all depends on just how national and global your perspective needs to be, and how comfortable you are with other software.

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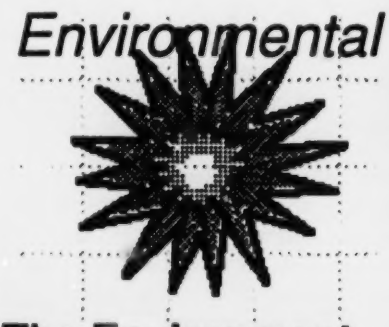
of the population were 65 years of age or older, and the remainder of the decade shows only modest increases over the 1990 levels. The following decade, again, shows only moderate increase in these figures, raising to about 13% in 2010, up only 1 or 2% from projections for the year 2000. However, it is estimated that the number of people 65 and over will increase dramatically, from between 13 to 14% in 2010, to 17 or 18% in 2020. By 2030 that number will have increased to nearly 23%, a 5 or 6% increase in only 10 years. In 1990 the life expectancy of males and females was 71.5 and 78.7 years, respectively. These are expected to increase to 72.5 and 80.0 years for males and females respectively by 2030, and to 74.7 and 81.3 years by the year 2080. It is thought that the aging of America will have a significant impact on America's world standing and leadership, calling for a prompt reconceptualization of America's strategic interests and domestic priorities. [Fosler, S. R. (1992, April 9). Demographic change and the American future. USA Today, p. 11A.]

Implications

The term "elderly" may imply retired but it should not mean feeble. The dramatic increase in individuals over 65 will result in part because these individuals are more active and healthy. Retired individuals possess a wealth of knowledge and experience that could be a valuable resource to an institution of higher learning, especially when they stay abreast in their field and/or expand into other disciplines. Their presence on campus reinforces the concept of life-long learning. They are capable of providing a unique, stabilizing perspective, often missing in undergraduate classrooms. Too, they often have extensive personal networks that may be utilized to support one or more aspects of the academic community, particularly in view of their increasing political clout. The retired are one segment of the community where a small investment in time and energy by the institution to develop special programs could reap a bountiful harvest of support.



The Environment and National Security

Senator Sam Nunn, chairman of the Senate Armed Services Committee, has proposed a shift in defense and intelligence resources to address environmental concerns in the creation of a Strategic Environmental Research Program. One purpose of this proposal is to retain research and technological capacity for the military establishment at a time when military budgets are shrinking. The major purpose, according to Nunn, however, is environmental. While many traditional security problems remain for the U.S., a new threat to our national security is the destruction of the environment. Nunn believes that many resources can be used for military and environmental purposes simultaneously. Aircraft and ships on military maneuvers, for example, could also collect environmental data. [Shabecoff, P. (1990, June 29). Senator urges military resources be turned to environmental battle. *The New York Times*, pp. A1, A12.]

Implications

Does Nunn's proposal signal a fundamental shift in the funding of national defense research? Universities receiving national defense research funding should broaden their perspective to identify social benefits of their research beyond national defense. Such activity may stimulate the establishment of new coalitions, both within and outside the university, to identify and expand the applicability of

Does Nunn's proposal signal a fundamental shift in the funding of national defense research?

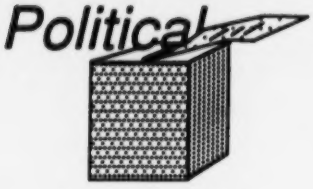
national defense research. Proactive institutions will provide forums to facilitate the establishment of new coalitions in these areas.

The Scanner's Book of Quotations, Number 1:

***When a thing is new, people say,* "It is not true." *Later, when its truth becomes obvious, they say,* "It is not important." *Finally, when its importance cannot be denied, they say,* "Anyway, it is not new."**

William James

Send us your contributions. The Editors



U.S. the Sole World Power?

It may be a mistake to think of the U.S. as the sole remaining world power now that the Soviet Union has dissolved. Perhaps the most significant political development in the latter twentieth-century world scene is the growing power of international agencies. Such agencies as the International Monetary Fund, the United Nations peacekeeping forces, the Bank for International Settlements and the 108-member-nation General Agreement on Tariffs and Trade, have exercised increasing influence and authority in adjudicating international disputes and integrating the nations of the world into an infant world monetary system. Most recently, and maybe of equal importance, is the recent meeting of the Earth Summit in Rio de Janeiro, which called for discussion on "practically every question that has been raised about the influence of humankind on the environment." What may be emerging is a new, tentative, but highly promising, world federalism. A global trade agency is negotiating away protectionism among farm states. A world economic coordinating mechanism is synchronizing a series of fast-moving reforms, from Mexico to Moscow. Though such global consciousness is quite in vogue, perhaps the most interesting and promising contribution of the Bush Administration to the growing interdependence of nations is the attempt "to keep these efforts from becoming captured by the standard Eurocratic culture of technique." [Warsh, David (1992, March 11). It's Time for the U.S. to weigh in on a global scale. *The Washington Post*, p.F3.]

National borders are becoming increasingly irrelevant. "Economic, technological and environmental trends have punched gaping holes in the once solid walls dividing country from country. Powers that were until recently the sole prerogative of national governments are shifting to multinational bodies and to businesses, individuals and innumerable citizen's groups of all kinds." In other words, the kinds of technological developments (e.g., telecommunications) and crises (the environment) that have replaced the threat of communism have made the idea of national, political sovereignty a problematic conception, at least as it has been understood in the past. The integration of the global economy has resulted in multinational firms that are virtually identical, whether they be American, French or Japanese. Moreover, environmental trends, both regional and global, share similar characteristics—"They all pose potentially serious losses to national economies" and are "immune to solution by one or a few countries" exactly because they reflect global, not national, questions.

Economic, technological and environmental trends have punched gaping holes in the once solid walls dividing country from country.

Further evidence of the "global village" can be seen in how the U.N. is coming to make distinctions between domestic and international affairs. There was a time not long ago when how a nation treated its own citizens was no one else's concern. But with the advent of human rights into international law, even the notion of "domestic affairs" is up for grabs. U.N. supervision of national elections in Haiti and Nicaragua would have been unthinkable only a few years back and the delivery of food and medicines to Kurdish Iraqis over Baghdad's objections was precedent setting. The tendency toward the pooling of sovereignty, however, is not without its problematic features. But despite resistance to the idea, the reality is that "as borders become more and more porous, security is seen to rest more and more on international, rather than national, conditions. It is also clear that no ability to project power beyond borders or to enforce order within them can protect a regime that cannot manage its economy and natural resources." [Mathews, J. (1991, August 22). Giving way to global concerns. *The Washington Post*, p. A23.]

Implications

American society faces a "new world order" with many different challenges. Mathews points out the growing influence of international agencies in keeping order. Lester Thurow points out in *Head to Head: The Coming Economic Battle Among Japan, Europe, and America* (NY: William Morrow, 1992), that the contest for world supremacy has shifted from a military contest to an economic one. In this contest, no one country will tower over another. Rather the action will be transnational in the form of trading blocs (Europe, the Pacific Rim, and North America). American institutions must redefine their role within this new order. This impetus puts more pressure on colleges and universities to redefine curricular and programs to prepare students to

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function in a global society, rather than a purely national one.

Congress Questions Foreign Aid (The New Isolationism?)

The subject of U. S. foreign aid has become one of the most avoided topics in the current American political scene. The "take-care-of-America-first" rhetoric reveals the creeping isolationism that is coming increasingly to control U. S. foreign policy. Washington is not likely to take advantage of the opportunity for exercising world leadership that lies waiting as a result of an end to the Cold War, even though it is calculated that about $100 million in foreign aid can be redirected from current recipients to the new republics of the former Soviet Union.

Despite the large-sounding totals, America devotes only about 0.3% of its gross national product on foreign aid, as opposed to 2% to 3% in the days of the Marshall Plan after World War II. Right now, the prospects for reevaluating the U.S. policy of giving to foreign countries are not good. A new mood of isolationism (some might say its pressing domestic needs) is behind these policy judgments. [Seib G. (1992, January 6). U.S. foreign aid, Unpopular at home, is slow to adjust to a changing world. *Wall Street Journal*, p. A11.]

Implications

Problems in formulating a comprehensive foreign aid program in light of unprecedented opportunity to facilitate the development of democracy around the world indicates an American crisis of leadership. Economic problems appear to be nudging us toward a new isolationism. College and universities have a role in preparing leaders with a global perspective for an increasingly politically and economically connected world. They also have an opportunity to assist these emerging eastern European countries in their development and at the same time establish new partnerships and coalitions to the mutual benefit of both parties.

Congressional Tenure Limited to Two Consecutive Terms?

The idea of term limits for Congress members has gained momentum in the past three years, and is presently drawing widespread attention. The popularity of term limits stems from America's growing distrust of its politicians and from numerous complaints about abuses by Congressional members. Advocates of term limits face the challenge of Congress. It would take a constitutional amendment to pass the idea by a two thirds majority of the House and the Senate. Supporters got creative however, and argued that an individual state had the right to restrict the tenure of its own congressional leaders without a constitutional amendment. In November of 1990, Colorado became the first state to vote on such a proposal, which it passed overwhelmingly. That vote, followed by the approval of term limits in California and Oklahoma, has sparked similar movements in more than a dozen states. A 1991 poll indicated 70% approval of term limits among Democrats, Republicans, and across racial groups and diverse income and educational levels. [Jost, K. (1992). Term limits: The issues. *CQ Researcher*, 2(1), 3-8.]

Term limit supporters hope to get initiatives to restrict state legislative and congressional tenure on the ballots in a dozen or more states in 1992 and 1994. At the present time, however, only 23 states allow initiatives. The only national group established to oppose term-limits was a skeletal clearinghouse and speakers bureau called "Americans for Ballot Freedom: Let the People Decide." The group was established in May of 1991, but failed to make a go of it and disbanded in October. The constitutional issue remains a major question mark for term-limit proponents. Most legal and political experts believe that the states have no power to limit congressional terms. [Jost, K. (1992). New initiatives planned. *CQ Researcher*, 2(1), 18-19.]

Implications

Congressional privilege and power is based on seniority. In the long term, states that unilaterally restrict congressional tenure legislate themselves into a weaker position of power relative to those states that do not restrict congressional tenure. Unless all states participate in term-limit legislation (e.g., through constitutional reform), it will not be in the interest of any state to continue the term limitation process. Thus, this movement is likely to die without much legislative impact.

However, this movement as well as the grassroots support for the candidacy of Ross Perot are signals of general dissatisfaction with the democratic process and the level of representation afforded to individual citizens. While the term limitation and Perot movements may be unsuccessful, their value as signals of social dissatisfaction should not be lost. In terms of direct implications for higher education, the public perception of the role of colleges and universities in the community is likely to have increasingly important impact on the ability of institutions to secure funding for their operations. Sensitivity to individual issues, particularly to issues important to the disadvantaged (e.g. cultural diversity, and violence to women), will demonstrate that the institution is "in tune with the needs of the community."

Government Subsidies to Civilian Commercial R & D Decline

R & D tax credits have been approved by Congress on a year-to-year

Political, p.12

Technological Growth

Growth of Information and Communications

We now have more information than we know what to do with. Like the old agricultural policy of the United States, which left grain rotting in silos while people starved, the United States' information policy is allowing "warehouses of unused information" to sit idly by while critical applications for that information go unmet. For example, during the last 18 years the Landsat satellite has taken a complete picture of the earth's surface every two weeks. The information in those photos would be invaluable to agriculturists, environmentalists, geologists, educators, city planners and businesses. "Yet, 95% of those images have never been seen by human eyes. They are left to rot in their digital silos in Sioux Falls, SD."

The problem, according to Al Gore, is that while we have automated the process of gathering information, we have not found a correlative means of making it available. "The amount of data now available—somewhere—to answer almost any question imaginable is staggering. But the sheer volume we have collected on almost every issue now threatens our ability to provide a definitive answer on anything. We're forced to deal not only with information, but also with "exformation": data existing outside our conscious awareness which nevertheless keeps us slightly off balance because we know it exists, even if we don't know where or how to use it.

Gore argues that we have the tools necessary for digesting and using this information—supercomputers—but because we lack the communications links required to make them truly useful, they reflect an unrealized capacity. Gore claims that the primary problem is that "our current network of telephone lines will not carry the elaborate graphic images that make supercomputers useful." Gore is calling for "information superhighways. . . a nationwide network of fiber-optic 'data highways' to link supercomputers and digital libraries." Whereas information lines currently transmit about 56,000 bits of information per second, Gore envisions a communication network capable of carrying several million bits of information per second. The importance of such a network is seen when it is realized that we are in the initial stages of "a truly global civilization based on shared knowledge in the form of digital code. The ability of nations to compete will depend on their ability to handle knowledge in this form." [Gore A. (1990, July 15). Networking the future: we need a national 'superhighway' for computer information. *The Washington Post*, p. B3.]

Implications

Skill in critical thinking is paramount as we face information overload resulting from the rapid growth of information and technical sophistication. Not only must we teach students how to access all forms of information, but also how to use information. Although many professors will argue that they teach critical thinking skills in their courses, many would assert that it is difficult to teach these skills in lecture classes. Furthermore, students must be taught the necessary techniques for filtering, organizing, and absorbing the desired information from the "overload" that they access—skills such as those offered by Richard Saul Wurman in *Information Anxiety* (Doubleday, 1989) and by Michael J. McCarthy in *Mastering the Information Age* (Archer, 1991).

Availability of Information

While many are excited by the possibilities for the proliferation of information made possible by new technology coming from the communications industry, tough questions remain unanswered. Perhaps the most pressing is "Who will pay for it?" The vision of a bold future, where "we'll all have a computer on our desk, and a phone in our shoe" (a tip of the hat to Maxwell Smart, the bumbling super-spy of the TV show "Get Smart"), or a possible future in which computer terminals and televisions will become "telecomputers" that can process video images and send them around the world on fiber-optic cable with threads as thin as human hair, may be near at hand. "But," says FCC Commissioner Sherrie P. Marshall, "who will pay for it? How will the infirm and the poor pay for it?" The possible proliferation of information on technologically advanced communications systems raises questions that spill over into complex public policy issues. If funding is not available to subsidize public access to this bold future, one may need to observe, as did Commissioner Ervin S. Duggan, that the "democratization of the Fax machine may not be desirable or necessary." Duggan went further to observe that with the increased usage of cable television service and pay-per-view programming, the potential of television as a teacher and as a source of information is liberating only to those whose access is possible because they can afford to pay by the minute. [Skrzycki, C. (1991, May 2). FCC fast-forwards agenda, probes technology of future. *The Washington Post*, pp. B10, B12.]

Implications

New technologies involving telecommunications, satellite communications, interactive TV and videodisks provide opportunities for transforming the design and implementation of instruction that can be carried far beyond the

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campus. The problem is one of resources. First, until the technologies are widely used, their costs will remain high. Early adopters will pay through the nose for their use. Second, what about human resources? Are professors on your campus prepared to use these new technologies in designing their instruction? Do you have a center for professional development capable of assisting them to use the new technologies? Third, what about students? Although the costs of computers have come down dramatically, they remain beyond the range of many students. Does your financial aid office consider the cost of a personal computer when deriving financial aid packages?

Electronic Breakthrough Allows Home Based Workforce

Developments in computer technology could result in vast social changes, not least of which would be their impact on the communications workforce. The "conversion of all manner of words, images and sounds into computer data, streams of ones and zeros" that can be fragmented, reformatted, manipulated and sent anywhere, has liberated us from paper, celluloid and vinyl. But it is also forcing a tremendous cultural and industrial tumult. "We are in the middle of a true revolution in media—the change from chemical processes to electronic ones," said Michael Schulhof, vice chairman of Sony Corp.'s U.S. unit.

The long-term results of this "revolution" are far from clear, but what is clear, is that it is forcing media companies to confront a radical change: customers now can organize and present information in ways once limited to publishers. The Times Mirror Co., for example, is exploring ways that make it possible for professors to create their own customized textbooks by dipping into electronic databases. At Dow Jones & Co. executives speak of futuristic news services that might enable investors to call up live videos of corporate events onto their screens and immediately buy or sell stocks over the same computers. Developments like these will no doubt make it possible for increasing numbers of people to do their work at home.

But there are drawbacks. The enormous "electronic networks," that are growing into a "computational membrane covering vast areas of the earth" may yield great amounts of information that are just passing users by. "We may actually be pushing the physical limits on the ability of people to process information," said Robert Jacobson, an information-policy consultant to the California state assembly. Once the information that is "out there" is made easily accessible, the impact on an information-age workforce is certain, though nearly unpredictable. For example, copyright laws limit the access and usability of certain information, but current computer systems demonstrate that this information can be copied and utilized in such a way as to avoid the usual compensation for copyrighted material. Of course, copyright laws may be altered so that compensation is conceived in different terms, but this still leaves consumers, the possible home-based workforce, at a disadvantage in terms of utilizing the almost unlimited amount of information that is available through the growing electronic networks. The late MIT communications scholar Ithiel de Sola Pool suggested a possible way that both copyright compensation and information overload could be dealt with in a single service: "Organized service functions for which users pay are the key to a compensation system for the era in which copying is easy but [in which] consumers need help in using the complex and overwhelming volumes of information." [Miller, M. W. (1989, June 7). Vast changes loom as computers digest words, sound images. *The Wall Street Journal*, pp. A1, A20.]

City and state-sanctioned telecommuting programs are grabbing attention on the West coast, but some workers across the country have been doing it for years. Jack Nilles, who coined the term "telecommuting" years ago, suggests the plusses of telecommuting are increased productivity, reduced employee turnover, lower office space needs, reduced real estate costs, better management, organizational flexibility, quicker response times, and better employee morale. Dennis Chamot, associate director with the AFL-CIO, is more cautious and sees little need for telecommuting. He sees most of its success with small, self-selected programs. It is too early to draw conclusions about how the average worker will benefit. [Telecommuting can unclog urban offices, freeways (1989, August). *Communication News*, From the Congressional Institute for the Future.]

> The . . . "electronic networks," . . . are growing into a "computational membrane covering vast areas of the earth."

Implications

For higher education, telecommunicating means the potential for more students and expanded programs. While it can be argued that telecommunicating should not and will not replace the campus living experience, telecommunicating may provide significant professional education opportunities to a poorly served portion of the population (i.e., those individuals currently employed seeking to improve their professional opportunities without leaving their jobs). Far too often people reach a "dead end" in their careers and seek new employment opportunities.

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Political, from p.9

basis since 1986, when the break was reduced to 20% from 25%. Right now these credits are a good subsidy to large companies, but are a detriment to small companies trying to compete. [Walters, D.K.H. (1992, January 30). Many co[illegible]panies are wary of R & D plan. *The L[illegible] Angeles Times*, p. D3.]

Of President Bush's promised $76 billion for R & D, half of that figure goes into defense-related research and development. With the exception of NASA, most federal civilian R & D expenditures are comparatively flat. [Schrage. M. [illegible] presidential puffery. *The Los Angeles Times*, p. D3.]

The Bush administration is encouraging companies to enter into cooperative projects with government laboratories. For example, last fall when Vivid Technologies Inc. was trying to develop an x-ray system for detecting bombs in airports, it got assistance from the Federal Aviation Administration in Atlantic City, NJ. In addition to licensing technology from research already done, the labs have been developing "collaborative research and development agreements" (CRADAs). Creative partnerships such as these will be necessary in an economy of shrinking budgets and cut backs. [Trumbull, M. (1992, February 18). Rich Federal research trove open to the public. *The Christian Science Monitor*, p. 7.]

Implications

The constraint on federal dollars for research and development forces companies into collaborative relationships. This provides institutions of higher learning with an unprecedented opportunity to interact with industry for the mutual benefit of both organizations. However, these interactions call for dynamic administrative leadership within the university to address issues specific to university-industry collaboration such as ethics, patent/intellectual ownership rights, academic jealousy and conflict of interest. Institutions of higher education that are administratively flexible enough to take advantage of these opportunities and to address these issues may reap a disproportionate amount of benefit in this difficult fiscal environment.

National Public Service

In 1990, under the new National and Community Service Act, Congress created a commission to test the waters for a national service program. Seven state and local projects were chosen as pilot programs and would sh[illegible]20 million federal funding. One [illegible]e models the idea of a youth corps and has been adopted in 65 towns, cities, and counties. America is still very far, however, from a mandated policy of public service. Although the idea resembles conscription, it is expected to gain more attention as the election draws near, particularly within the Democratic platform. [Reinventing the wheel. (1992, June 13). *The Economist*, p. 29.]

Implications

A national public service program has been viewed by many educators as another competitor for scarce resources (entering students). However, the concept of national service provides an opportunity to propose integrated education and service models whereby a portion of the required curriculum consists of laboratory work or field research that provides social service as well as educational experience. Students enrolling in such curricular programs, therefore, could fulfill the national public service requirement while receiving a stipend.

Technological, from p.11

Unfortunately, new opportunities often require the acquisition of new skills. Many times these new skills cannot be obtained because people cannot afford to leave their jobs or move to the location where these new skills are taught. Professional training programs offered through telecommunications are one mechanism to train skills and yet maintain economic status. These programs are likely to be well received because they can simply be viewed as an investment into a new career.

Parker Rossman in *The Emerging Worldwide Electronic University: Information Age Global Higher Education* (Westport, CT: Greenwood Press, 1992) describes signs of an emerging global classroom, whereby students in one country take courses in another via computer conferences and/or TV, a practice facilitated by electronically available catalogs of courses, electronic access to research libraries, and on-line electronic bookstores. Faculty members meet with students from around the world in "hyperspace," and use virtual reality classrooms and electronic, multimedia textbooks. We are indeed approaching the end of an era in which colleges can be bounded by a wall with a narrow gate, when all students are kept in one place at one time (sharing finite resources and faculty), and when students stop their education when they leave campus. Mel Elfin (1992, 28 September. U.S. new 1993 college guide, *U.S. News and World Report*, 100-112) describing the college of tomorrow, maintains that America's colleges and universities are standing on the edge of a "breathtaking transformation." Those institutions anticipating this transformation will be the most successful in the new era.

the environmental scanning newsletter
for leaders in higher education

on the horizon

From the Editor

A number of readers have written to ask about our publisher, The Institute for Academic and Professional Leadership at the University of North Carolina. The Institute, approved by the UNC Board of Governors this semester, is charged with offering professional development seminars to leaders in higher education. This fall, for example, it offered two seminars in a professional development series for community college presidents in North Carolina—"Developing and Managing the Executive Team" and "Trustees as a Greater Resource for the College." This winter, the Institute will offer two more seminars in this series—"Applying TQM Concepts," and "Issues Management: A Decision Support System for Managing Uncertainty."

The Institute is a part of the Program in Educational Leadership, UNC School of Education, which also sponsors professional development seminars. This coming July (9-13), the Program will cosponsor the third global change seminar, "Surviving and Prospering in a World of Change" with King Alfred's College Winchester and H+E Associates, Ltd. If you would like to be put on the mailing list for announcements of forthcoming seminars by either the Program or the Institute, please send me a note.

In the February issue, we will begin to focus on critical issues affecting higher education. Two such issues currently occupy much of the space in our local papers—multiculturalism (you may have read of the tension of establishing a free-standing black cultural center on our campus) and tenure (three professors who have won teaching awards were denied tenure this year). This is designed to be an interactive newsletter. Please send me your nominations for the "critical issues" list.

Finally, a number of people have written me concerning site licenses to copy and distribute *On the Horizon* to their staffs or to institutional planning committee members. This is an excellent use of the newsletter; please write or phone me if you are interested in such an arrangement.

A New Social Charter for Higher Education?

Ian Wilson, SRI International

Today we are living through the most significant political and economic restructuring that the modern world has seen. The condition is pervasive, tumultuous, and continuing. As a result, for the rest of the 1990s (and beyond), institutions of all sorts—government, unions, corporations, health care, the United Way, and—yes—colleges and universities—will be adapting to new roles, new responsibilities, and new relationships.

Four formative forces are reshaping the roles and responsibilities of these institutions and, most importantly, the relationships among them:

•The "power shift" — a cluster of disparate yet related political trends, including the shift in geopolitical relationships (with the disintegration of the former Soviet Union and the rise of Japan and the European Community); the worldwide movement toward "democracy" (variously defined); a growing preference for market systems; selective deregulation (in economic rather than social arenas); and privatization of previously public institutions and services;

•Globalization — the increasingly global flows and networks of trade, production, finance, technology and, most importantly, information;

•Economic restructuring — the wrenching changes in the nature, location and structure of economic activity, in virtually every nation, industry and company, that drastically affect the levels of economic growth and so the availability of resources for individual and social purposes;

•Transforming technologies — the cluster of computer, communications and related technologies that are transforming the industrial, mass-production economy into an information-rich, value-added economy.

In addition to their direct effect on higher education, these forces will also change social values and so the public's expectations of what the new role of a college or university should be. Given the current level of national concern over U.S. competitiveness and employment (both the number and type of jobs available), it is difficult to avoid the conclusion that "a new charter of social expectations" for higher education will be written around its role in assisting the United States — its citizens and its institutions — adapt to the requirements of the changing global economy.

Implications of this new charter for a changed role for colleges and universities are noted in the figure below, and include:

•Focusing on the cultural and technical capabilities needed by both business and individual job-seekers in an age of globalization, restructuring and rapid technological change;

Continues, p3, col.1

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"... boundaries between the academic and business worlds will be blurred ..."
Ian Wilson

SOCIAL

Teenage Pregnancies

•Birthrates for teenagers have been on the increase since 1987. Some attribute the increase to a dramatic rise in births to teenagers ; since 1986, Hispanic teenagers have made up more than a third of the increase. Others say that the teen birthrate growth is caused by teenagers becoming sexually active at earlier ages. More than 1 million teenage girls—one in every ten under the age of 20—become pregnant in the U.S. annually, and teens have 25% of all abortions. The birthrate for white teens has increased slightly, by 6%, from 1980 to 1989. [Shapiro, J.P. (1992, July 13). The teen pregnancy boom. *U.S. News & World Report*, p. 38.]

•One American child in five is born out of wedlock, 40% to teenagers. [*What lies ahead: A decade of decision.* (1992). Alexandria, Virginia: United Way Strategic Institute, p. 18.]

☞Implications

Teenage pregnancy continues to impact, not only on the young woman's prospects and needs, but also on the institutions charged with continuing her education. Teachers, administrators, and other school staff members need to be trained to understand and deal with the unique problems associated with this social phenomenon. At a minimum, colleges and universities have a role to play both in training these personnel and in providing consultative services. Some will begin looking into ways to make themselves more accessible to single parents of school-age children.

A New Demographic Ballgame

The 1990-2010 period represents a rapidly changing demographic situation for institutional mission, clientele, faculty, access, and equity.

One-half of the population growth in the 80s was in three states: Florida,

Continues, p3, col.2

Wilson, from p.1

•Shifting the balance of educational programs even further toward continuing education as "lifelong learning" becomes a necessity, not just a slogan, to deal with obsolescing knowledge and skills;

Traditional Economy	New Economy	Key Roles for Colleges and Universities
•Slow-moving technology	•Rapid technical change	•Applied research, technology transfer
•Distinct technical fields	•Merging technical fields	•Multidisciplinary programs and centers
•Focus on domestic markets	•Focus on global markets	•Knowledge of new cultures, languages
•Human resources as a factor of production	•Human resources as a competitive edge	•Industry-responsive educational system
•Slow-changing skill requirements	•Rapidly changing skill requirements	•Lifelong learning, extension programs
•Employment growth in "Fortune 500"	•Employment growth in new and small firms	•Support for entrepreneurship and commercialization

•Working with government and corporations to develop the "centers of technological excellence" that a competitive United States will need.

The concern, and indeed outrage, arising against such a forecast is predictable. One can already hear the cries of "sell out," "prostitution of academic principles," and "corporate corruption." Indeed, the boundaries between the academic and business worlds will be blurred; there will be increased traffic and exchange between these two worlds. As Jay Ogilvy of Global Business Network has written, "This could mean an end to tenure in the academic world, or the beginning of sabbaticals in the business world."

However, this future need not entail higher education becoming a glorified "trade school" or a wholly owned subsidiary of corporate America. There is far more to this

". . . this future need not entail higher education becoming a glorified "trade school . . ."

mission than upgrading the technical skills of displaced machinists. To my mind, this linkage to economic development and social adjustment can be translated into a far-reaching, energizing and honorable vision, much as the socialization of immigrants was for public education earlier in this century. But it will require foresight, imagination, effort and extensive cooperation with government and business. To paraphrase Edmund Burke, the only thing needed for the triumph of the worst is for good men (and institutions) not to strive for the best.

Ian Wilson is a senior management consultant at SRI International. He recently published a report titled *Rewriting the Corporate Social Charter*.

Social, from p.2

Texas, and California.

Non-traditional households grew twice as fast in the 80s as the traditional married couple households.

Youth in the "Boomlet" age group will increasingly be at risk of school failure —in large part from the stresses of poverty in single parent homes—and may not be candidates for higher education.

Students in higher education are becoming much more ethnically diverse, while the faculty are not.

Over the 1990-2010 period, states will become more unlike each other in terms of demographic characteristics.

The aging of populations in heartland states may lead to an erosion of public support for higher education in those states.

State colleges, independent colleges, and proprietary and vocational institutions are most at risk during the 90s.

☞Implications

Harold Hodgkinson offered these suggestions for meeting the needs reflected by demographic changes.

• Focus on institutions demonstrating special skills in working with poor and minority students;

• Send very clear signals that encourage minority participation in higher education;

• Revise the current basic delivery mechanism to make the system more functional for a diverse student body;

• Enlarge the pool of talented faculty, administrative and board leaders from minority and poverty backgrounds.

[Hodgkinson, H. (1991, March). *Testimony to US Congress on the Reauthorization of the Higher Education Act.*]

The Life-style Odyssey

There are six overall principles that will shape the lifestyles of the 1990's: 1) Fragmentation: on many levels, as minorities increase, and consumers splinter into many groups (yet there will be a yearning for cohesion, which may lead to a national political consensus); 2) Bifurcation: as the middle class shrinks and people move up- or down-scale; 3) Optimism/Self-Confidence: Americans remain generally satisfied and self-confident about their personal situation, but confidence in the country has declined; 4) A National Lifecycle: just as individuals go through a mid-life crisis, America is entering a pre-crisis time and a more mature nature will emerge, with the global community more a part of our lives and with the environment as a priority; 5) Need for Control: Americans will seek to control their lives or at least get a feeling of control; stress reduction will become a watchword and inform household activities; guarding individual rights

against Big Brother will be a consistent theme; 6) Recession/ Money: income growth will be flat through the early 1990s, and taxes will continue to rise; personal bankruptcies-now at a record high-will increase 10% annually, notably in the Sunbelt.

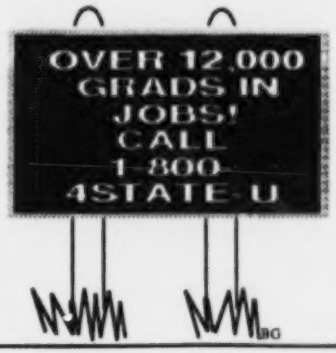
Microtrends include:

1) Demographics: the divorce rate will continue its slow decrease; the trend toward later marriage is peaking; the number of single adults will continue to climb from its present all-time high; traditional households of related persons will be surpassed by non-traditional households about 2010; 2) Home: people are fixing up their current homes instead of moving into bigger ones (almost half of current homeowners plan to renovate in the next few years); there are now more cat-owning households (46%) than dog-owning (40%), a change from 21% cats/35% dogs 35 years ago; 3) Money: we live in a time of financial caution (the average household debt is 94% of its after-tax income); a growing number of people are stuck just above the poverty line and not able to gain ground; 4) Shopping: a shift from "shop till you drop" to "shop when you have to" due to scarce time and money and less conspicuous consumption; second-hand goods will rise in stature, and wastefulness will be frowned upon; men are doing slightly more shopping than in the past and will do more in the 1990s; as many as 20% of all regional shopping malls in the US will close by 2000; over half of today's retailers will be out of business by 2000 as Americans shop more in catalogs and discount stores; 5) Food: more fast food, and faster food, healthy eating, pleasure eating, and environmental concern (purer products with less packaging); away-from-home food spending will rise in the 1990s from 38% to 41% of the food dollar; 6) Media: Americans watch TV 28 hours a week, up slightly from 25 hours in 1950, but the overall opinion of TV has been turning downward since the 1960s; as many as 90% of US households may have a VCR by 1995; there will be more advertising clutter and decreasing ad recall by viewers; 7) Work: career-obsession is on the wane, as a middle-aging nation seeks to balance work and family; anxiety about job security is increasing: fewer than one-fourth of US workers feel secure in the long-term prospects of keeping their present job; 8) Travel: the shortage of time for pleasure travel derives from extensive work hours, the hectic pace of life, and the increasing difficulty for two-income couples to coordinate vacations; Americans are taking shorter vacations closer to home; business travel has increased 48% in the last five years but cost-cutting may keep demand down; 9) Health and Fitness: the rhetoric of wellness will be taken more seriously, as Americans diagnose their own ailments, exercise more, eat better, focus on stress reduction, and explore alternative medicine. [Miller, E. (1992, January). *The Lifestyle Odyssey: The Facts Behind the Social, Personal, and Cultural Changes Touching Each of Our Lives*. Naperville, IL: Sourcebooks Trade.]

☞Implications

These trends signal important changes for higher education. The gradual reduction of the middle class will mean that fewer students will be able to afford a college or university education. Decisions as to whether or not to pursue a university degree, and if so, which university to attend, will be based to a much greater extent on cost/benefit issues. As a result, colleges and universities will be under much greater pressure to define their programs in terms of successful outcomes and of the quality of support within each program. Proactive colleges and universities will begin to establish mechanisms to solicit and address the concerns of the current student body to improve the quality of their educational experience. In an environment of cost reduction and quality improvement, colleges and universities will be forced to limit the number of programs they support. Indeed, administrators face the hard decision of closing some programs. The upside, however, is that as some institutions close programs, others may view this as an opportunity to develop this niche.

"... Colleges and universities will be under much greater pressure to define their programs in terms of successful outcomes and of the quality of support within each program."



TECHNOLOGICAL

Computer Integrated Manufacturing

Until the robotics industry undergoes significant technological advance, industry must look elsewhere, to revive sagging productivity. New uses for current computer systems may be the answer. "The secret to competitive manufacturing, the new scenario goes, lies less in heavy automation and more in using computers to gather information from the factory floor and swap it with information from every other aspect of a business—from the sales department to product engineering to the shipping docks."

This at least, is how some companies are streamlining their business processes so as to decrease the time required from the production to the delivery of products. And it seems to be working. It's called computer-integrated manufacturing, or CIM, and needs only the right equipment and software to be put in place.

CIM integrates functions that traditionally have been separate, seeking "to streamline with quality control and just-in-time manufacturing, and to give every machine and employee the ability to talk with each other and 'watch' a product as it moves through the entire corporate pipeline." Motorola, for example, has been using a computer-integrated process since 1988. A Motorola sales representative takes an order, say for 150 black Bravo pagers to be delivered on May 17, types the order into a laptop computer, specifies the unique code that causes each pager to beep and requests delivery in two weeks. "The order zips over phone lines to a mainframe computer in a new factory in Boynton Beach, Fla. The computer automatically schedules the 150 pagers for production May 15, orders the proper components, and, on the day after assembly, informs the shipping docks to express-mail them to Pacific Telesys Group (the company that ordered the pagers) in California."

By connecting each aspect of the manufacturing process via computer links, costly time delays and lack of communication between sales representatives and production engineers (often a problem when sales persons are not aware of their company's production potential and product capabilities) can be brought to a minimum. This is possible because the machines and computers found in the factory use the same language as the computers used in sales and shipping. The result for Motorola is that the Boynton Beach facility can produce the Bravo pocket pager at the same cost as the Singapore plant, which has cheaper labor and is not integrated, and "deliver, over-night, custom-built pagers that used to take nearly six weeks to supply." An additional benefit is that Motorola was able to use "mostly the same machines that populate the company's older factory floors," and so did not incur great expense in developing and/or purchasing new equipment.

If CIM is as successful as it is hoped it will be (its use by other companies such as Apple Computer Inc., and Federal-Mogul Corp. suggest that it will indeed be successful), two birds may be killed with one stone: While some industries are being revived, computers are finding new applications, further contributing to their proliferation. [Yoder, S. K. (1990, June 4). Putting it all together. *The Wall Street Journal*, pp. R 24, R25.]

☞Implications

The application of CIM and "just-in-time" management in industry has implications for curriclum development. Educators who scan the microenvironment to identify new trends and developments in the social, technological, economic, environmental and technological sectors for curricular opportunities will put their instititution ahead of the game. This requires having the tools, the training, and the incentive to transform these opportunities into curricular programs and materials (such as just-in-time textbooks, syllabi, and guest speakers—on hand, via conference call, or by satellite).

Alternative Energy Sources

A study released by the American Gas Assn. suggests that increased research and development of natural gas and alternative sources and a freer energy market could cut the nation's carbon dioxide emissions by 10% by the year 2000. The study advocates dropping state and local free market "barriers" such as those requiring emission scrubbers for electric power plants, or mandatory use of coal. Instead, it relies on higher efficiency appliances and doubling the use of renewable sources—including solar, geothermal, biomass and wind—while increasing use of natural gas by 40% by 2010. This would reduce oil imports and increase domestic employment in both the oil and gas industry and in energy conservation and renewable energy. The study estimates the creation of from 200,000 to 400,000 new jobs in renewable energies and energy conservation alone. Persons in the coal industry, however, say that it would merely shift jobs to other sectors. [Parrish, M. (1992, May 1). Energy coalition pushes an 'alternative future'. *The Los Angeles Times*, p. D2.]

The Danish government is pushing ahead with one of Europe's most ambitious alternative energy projects—a program that would make Denmark the first country in the world to use wind power as a significant contributor to its national electricity grid. At the present, only California has installed greater wind-power capacity. Denmark is in the final stages of an initial expansion that will triple its wind power by the end of the next year to cover nearly 10% of its electricity requirements through wind energy. Denmark and California together produce 90% of the globe's wind-generated electricity. [Marshall, T. (1992, April 7). Danes no blowhards on alternative energy. *The Los Angeles Times*, p. H4.]

According to Greg Rueger, general manager of the nation's largest investor-owned utility, Pacific Gas and Electric Co., the newest generation of wind-power turbines already can match fossil fuel facilities on price. Rueger estimates that the newest, third-generation windmills, if mass produced, could make electricity at a lifetime cost of 5.5 to 6.5 cents per kilowatt-hour in good wind areas. That compares with 7 cents an hour for a new gas/oil fired plant in the PG & E service area. Solar generation still costs around 10 cents per kilowatt hour, although that too is dropping. A recent project may have produced equipment that lowers the cost to 8 cents. [Dillin, J. (1991, March 14). *The Christian Science Monitor*, p. 26.]

Edison and Texas Instruments recently announced a solar technology breakthrough. A relatively low-cost solar photovoltaic cell has the potential to provide one-third of an average home's electricity using a 10-by-10 foot rooftop panel. [Bryson, J. E. (1991,. May 19) Change is in the wind—and the sun. *The Los Angeles Times*, p. M5.]

A biomass plant, operated by Delano Energy Co., takes 700 tons of prunings, fruit pits and waste wood a day from nearby orchards and burns them in a state-of-the-art furnace that emits fewer emissions than an old-fashioned wood-burning stove. The resulting heat is used to make steam that drives turbines. Enough electricity is generated to serve the needs of about 30,000 California households a day. The Delano power plant produces energy at a cost of roughly 8 cents per kilowatt hour, making it close-to competitive with coal (about 5 to 7 cents per kilowatt-hour) and natural gas (5.5 cents). But the biomass plant was only able to get financing in the first place because state incentives encouraged utilities to buy power from such plants at rates above market levels. More dollars are needed for help in construction of such plants. Biomass plants are among several so-called renewable energy technologies that proponents argue hold the greatest promise for replacing the fossil fuels and imported oil this country uses to generate power. [Lee, P. (1991, March 26). Interest in alternative fuel sources heats up in U.S.. *The Los Angeles Times*, pp. A1, A8.]

A new $700 million Federal fund has authorized a six-year demonstration program to explore magnet power for trains. This type of train would have no locomotive but would be lofted above its track by a magnetic cushion and propelled by a magnetic wave. These trains would travel at a very high speed, with high efficiency and with little or no wear. Demonstration trains in Germany have established a speed record of 273 miles an hour over a test track. Planners in Florida hope to build a 14 mile maglev (magnetic levitation) train route from Orlando airport to Disney World. The downside is that this Florida track is estimated to cost $500 million. This technology is not cheap; that is the present fly in the ointment. [Browne, M.W. (1992, March 3). New funds fuel magnet power for trains. *The New York Times*, pp. C1, C11.]

A discovery by nuclear scientists at the Joint European Torus (JET) laboratory at Culham, England has convinced scientists that fusion power will be generating virtually limitless amounts of cheap, pollution-free electricity in the 21st century. Unlike fission reactors, which split atoms to produce energy, the Torus reactor pushed atoms of deuterium and tritium together to generate a temperature of 200 million degrees C. In future years, scientists will face challenges of designing, building, and paying for a working fusion reactor, as well as containing impurities. International cooperative efforts are now in the works to face future research challenges. If the necessary money can be mobilized (approximately 3 billion pounds), the reactor could become operational in the 21st century. [MacLeod, A (1991, November 20), Fusion power future looks bright. *The Christian Science Monitor*, p. 12.]

☞Implications

Developing low-cost, pollution-free energy constitutes a major challenge to research agencies, including research universities. When these efforts pay off, resources traditionally directed to energy could be redirected to social issues, health care and education.

Delphi Forecast of Information Technology

Information technologies will grow far more sophisticated in the next few years, but social acceptance of some information services is likely to lag behind. The most important technologies recently selected by science and technology reporters include:

- miniature machines
- electrical superconductors
- animal and crop engineering
- tailor-made materials
- fiber-optic networks
- wind and battery power
- high-definition TV
- more complex/valuable computer chips
- object-oriented programming

[*New York Times News Service*, (1992, February 3)]

☞Implications

Two functions of higher education are to advance knowledge and to disseminate knowledge. Colleges and universities could influence social acceptance of information services by not only utilizing the technologies in classes, but via service roles in partnership with business and governmental agencies where these technologies are used.

ECONOMIC

Productivity

Thomas E. Hall, Miami University (Ohio), sums up the U.S. economic problem as the loss of its competitive edge during the past 20 years. The question now dominating political debate is why and what can be done about it. Hall says the problem is rooted in the slow growth of labor productivity since 1973.

Labor productivity in the U.S. grew at an average rate of 2.4 percent a year between 1960 and 1973. From 1973 to 1989, the rate was only 0.8 percent per year. Productivity growth in Japan during the same time has averaged about 6 percent.

Two factors are at play in the slow growth of productivity—inadequate investment in plants and equipment, and a declining rate of technological innovation. Both of these, in turn, are caused by the high cost of capital in the U.S.

Hall sees no immediate remedies, but stresses the need for actions to begin rebuilding productivity. Polices to encourage savings and reduce the budget deficit would be a good start. ["The Real Problem: Productivity Deficit," (1992, Summer), *The Forum*]

☞Implications

The relevant question is how to increase technological innovation at the lowest possible cost and boost the research and development capacity of universities? Encourage and support corporate-university partnerships that allow universities to reduce development costs by actively participating in the product development process. Of course, problems vis a vis proprietary ownership of knowledge versus free discourse of knowledge arise from such collaboration. However, a well-managed private industry-university research system can be a win-win solution for industry and for universities.

Another implication of the push for productivity is the expectation that colleges and universities will become more "productive." Increasingly, state legislators are questioning what they perceive as low teaching loads and overly liberal leave policies. As the dialogue between the state house and the campus becomes more heated, college and university public relations people will have their work cut out for them.

Military Conversion

The end of the Cold War allows the US to cut defense spending substantially. In 1991, national defense employed about 6 million people (about 5.1% of the labor force) in the private defense industry, the active duty military services, and Department of Defense civilian ranks. "Assuming large, sustained cuts in defense spending over the next 10 years, as many as 2.5 million defense-related jobs could be gone by 2001." Government programs can ease the adjustment for workers, veterans of the armed forces, and communities, and can offer help to defense companies that want to convert to more commercial production. [US Congress Office of Technology Assessment (1992, February). *After the Cold War: Living with Lower Defense Spending*. Washington: USGPO]

From WWII to 1988, the US spent $9.6 trillion on the military (1982 dollars)-about $1.5 trillion more than the estimated value of all US tangible assets except for land. Military spending has hobbled civilian public investment. As a nation, we must begin charting the scope of conversion and defining markets for alternative civilian products. But conversion is not as simple as it was after WWII, when the US had a huge pent-up market for consumer goods backed by huge accumulated savings. Moreover, the effort during WWII lasted just four or five years, and many plants needed to do no more than return to what they had previously been making. Today's military plants and bases never had any commercial purpose, and employees have never known what it is like to work in the cost-conscious civilian sector. Conversion must not be mere work relief for a diminished military establishment, but a concerted effort to redirect America's energies toward restoring its industrial health. If the government reverses past neglect by rebuilding the infrastructure, renovating ground transportation, and improving the energy efficiency of the entire economy, big civilian markets will open up. The most serious obstacle to conversion is that recent administrations have opposed it, fearing that this constitutes "industrial policy". But the US has been pursuing an industrial policy of excessive concentration of resources in the military. This must change. "What is at stake in conversion is nothing less than the nation's economic future. . . Failure to take action now would be one of the most portentous blunders in US history." [Ullmann, J. (1991, Aug-Sept). Building a peacetime economy, *Technology Review*, 94:6, pp. 57-63.]

☞Implications:

Military-trained and experienced personnel will be leaving the armed forces in record numbers to find work in the private sector. Additional education will be required at all levels, (i.e. from basic skills training to inclusion in professional programs.) These individuals will be older, more independent and more financially secure than traditional students. Many will find basic employment and attend school to improve their position. They will be former members of the armed services, former civilian employees of the armed services, and former civilian employees of military contractors and closely associated businesses and educational institutions. Career counseling will become an important service to these individuals, and is one avenue for programs in higher education to identify the needs of this population and to establish or re-design programs to serve this special need Such efforts may be exceptionally challenging, because the ex-military person's response to "What skills do you have?"

or "What did you do?" can be incomprehensible to the ordinary faculty advisor or career counselor without a broad military background, making it difficult to appreciate special strengths. Specially designed non-resident programs, off-campus programs, evening and weekend courses, and internship programs will have significant appeal.

ENVIRONMENTAL

Increased Concern for the Environment

The Greens, a political party known for its focus on environmental issues, appears to have registered enough voters (1% of the votes cast in the last election) to be constituted as California's sixth qualified political party. Though known for its environmental activism, the Green Party of California considers its interests to be much broader. According to Hank Chapot, a Party spokesman, the Greens are "an activist party standing for diversity, ecology, social justice, peace and grass-roots democracy." Other concerns are post-patriarchal values, decentralization and community-based economics. The Greens, originating in Germany, are now located in over 50 countries world-wide. Ballot drives like the one in California are currently being waged in several other states. [Weintraub, D. M. (1991, January 3). Environmentalist green party may have ballot spot. *The Los Angeles Times*, pp. A3, A26.]

Several European nations are taking the lead in making plans to ban ozone-eating chemicals. Finland, France, Germany, the Netherlands, Denmark, Britain, Spain, Norway, Switzerland, Italy, and Sweden are making plans to phase out chlorofluorocarbons (CFCs) by 1995. The U.S. is following suit. The new democracies of Eastern Europe, however, have not jumped on the band wagon. Handling CFCs is largely a non-issue in these lands that are struggling just to survive. [Fritz, M. (1992, March 5). European nations race to stop ozone rip. *The News & Observer*, p. 9A.]

A Wall Street Journal/NBC News poll last year showed that 67% of Americans are willing to pay 15 or 20 cents more per gallon for cleaner gasoline. But a similar majority opposes a 25 cent a gallon tax to encourage less driving [Knickerbockrer, B. (1991, August 30). Americans adjust their life-styles, slowly, to changes in energy use. *The Christian Science Monitor*, p. 3.]

☞Implications

These are early signs of a potentially major social revolution characterized by a shift in focus away from the needs of large organizations to the individual needs of people. Concomitant with the political shift away from large organizations may be an increase in interest in the study of the democratic process, with a particular emphasis on individual rights. The areas of law, journalism, policy development, political science, and policy analysis are likely to be attractive areas in this new political environment.

POLITICAL

The Clinton Administration's Impact

Warren Cikins, The Brookings Institution

(The following article and implications are modified from remarks delivered by Mr. Cikins to the United Way of America Environmental Scanning Committee this past October. *Editor*). The election of Bill Clinton as President of the United States should give the leaders in American higher education a surge of optimism about the future of government support for education. Clinton is a person who in temperament and action gives one the belief that education means far more to him than it did to George Bush. Clinton understands how crucial higher education (and concurrent research and development) is to the economic development of our country.

Clinton understands how crucial higher education (and concurrent research and development) is to the economic development of our country.

How does this Clinton image translate into action? What did Clinton promise during the campaign? A brief summation of those pledges (with some overlap of elementary and secondary education matters with higher education) is as follows:

(a) making loan funds available to enable everyone qualified to attend college to do so (possibly creating a bi-partisan commission on student financial aid);

(b) developing an innovative system for repaying loans, perhaps something like a National Service Trust Fund to provide the wherewithal to repay loans in return for public service rendered;

(c) strengthening the research and development capability of American colleges and universities, including the conversion of defense-oriented research to civilian-oriented

research, such as a civilian Advanced Research Projects Agency or dual-use technology partnerships;

(d) giving greater priority attention to worker on-the-job training, keeping up with technological and other job changes (possibly requiring employers to spend 1.5% of their payrolls on continuing education);

(e) increasing federal spending on education by $10 billion in 1993 and by $20 billion in 1996; and, finally,

(f) shifting priority orientation to public rather than private education.

The risks to, and difficulties associated with, this agenda are as follows:

(1) the difficulty of keeping education needs at the highest priority level in the face of other concerns such as economic stimulation, debt and deficit reduction, health care reform, global defense crises, and welfare reform;

(2) the sense of overcommitment to a set of goals that are very expensive, are controversial, are working at cross-purposes, and are possibly counterproductive;

(3) the inability to mount a sustained effort in the face of competing needs, lack of sound and disciplined leadership; and

(4) the unavailability of adequate funds.

☞Implications

After preparing a coherent and generally acceptable blueprint for action, college and university presidents need to get to work immediately to build alliances with those of like views. By working with other educational stakeholders to resolve conflicts, they can ensure that as unanimous a position as possible is presented to the Administration.

One useful approach might be to propose a well planned education summit similar in intent to the recent economic summit, but with more coherent priorities. (The outcomes of the economic summit, along with the promises detailed above, should provide a springboard, however.)

Given the current stated intention of cooperation, such a summit could provide the rationale for a series of congressional hearings.

The federal education establishment reaches far beyond one or two agencies, and those with the power to help or hinder our institutions can be found in the most unlikely places, and on both sides of the Potomac. If the new administration is to be given effective guidance, it is incumbent on educational leaders to go to Washington with the most detailed possible map of the territory. Associations can be invaluable in providing support, and much is likely to be learned about association leaders as they shift gears to deal with new faces and political agendas. However, new administrations want to be assured that our representatives truly represent us. As do we.

Development of Regional Trading Blocs

The Asia-Pacific region has the fastest growth rate of any region, and this growth is likely to continue into the next century. Japan emerged as the world's economic powerhouse during the 1980s and is the economic giant of this region. Japan is expected to show more real economic growth over the next 10 years than the U.S.; its continuing foreign-trade surplus will drive additional global investment during the 1990s. The Japanese economy is adjusting to new pressures, however. Savings are declining. Japan's trade surplus with the U.S. fell in 1989. Chronic labor shortages are affecting the Japanese economy. [What *lies ahead: A decade of decision.* (1992). Alexandria, Virginia: United Way Strategic Institute, p. 39.].

Free-trade agreements can provide solid economic benefits to the U.S. In 1990, two-way trade with Mexico approached $60 billion, up $8 billion over the previous year and double the 1984 total. Free trade negotiations can address the important Mexican barriers that remain, including numerous auto trade restrictions and import licenses on many agricultural goods. A free-trade agreement also can help us to compete globally in the 21st century. The EC is creating a trading bloc with a population of 325 million and an economy of almost $5 trillion, and Japan is strengthening its trade ties with its Pacific Rim neighbors. The result is greater European and Asian export competitiveness. Free trade with Mexico and Canada can help us face that competition. [Bentsen, L. (1991, March 29). Pluses, minuses of free trade with Mexico. *The Christian Science Monitor*, p. 19.]

If the U.S. teams up with Canada and Mexico in a free-trade agreement, as it is expected to do, this North American bloc could easily dominate the world economy. Together, the three countries have a population of 350 million and a $6 trillion GNP, surpassing the European Community. [*What lies ahead: A decade of decision.* (1992). Alexandria, Virginia: United Way Strategic Institute, p. 40.)]

☞Implications

The North American free-trade agreement will have a significant impact on American society. Corporations, governmental agencies, and colleges and universities will increasingly focus on Canada and Mexico. Executives, workers, students, and professors must work closely with culturally divergent groups to establish plans that are to the mutual benefit of all parties involved. Colleges and universities thus have more incentive to integrate the curriculum with a multicultural/global perspective to prepare students to function more effectively with individuals with different backgrounds. An increasing number of institutions will require a foreign language for graduation. Too, the number of academic exchange programs will sharply increase.

Congress Questions Foreign Aid (The New Isolationism?)

The subject of U. S. foreign aid has become one of the most avoided topics in the current American political scene. The amount of "take-care-of-America-first" rhetoric reveals the creeping isolationism that is coming increasingly to control U. S. foreign policy. Washington is not likely to take advantage of the opportunity for exercising world leadership that lies waiting as a result of an end to the Cold War, even though it is calculated that about $100 million in foreign aid can be redirected from current recipients to the new republics of the former Soviet Union.

[Pat] Robertson has formed the Christian Coalition to rebuild the foundation for a free, sovereign America and to wage the "epic struggle" between "people of faith and people of the humanistic-occult sphere."

Despite the large-sounding totals, America devotes only about 0.3% of its gross national product on foreign aid, as opposed to 2% to 3% in the days of the Marshall Plan after World War II. Right now, the prospects for reevaluating the U.S. policy of giving to foreign countries are not good. A new mood of isolationism (some might say its pressing domestic needs) is behind these policy judgments. [Seib G. (1992, January 6). U.S. foreign aid, Unpopular at home, is slow to adjust to a changing world. *The Wall Street Journal*, p. A11.]

According to Pat Robertson, televangelist host of The 700 Club, the new world order is actually a quest to eliminate national sovereignty, to destroy the Christian faith, and to establish a world government, a world police force, world courts, world banking and currency, and a world elite in charge of it all. To Robertson, dominant forces espousing this view are the Council on Foreign Relations and the Trilateral Commission—the behind-the-scenes Establishment. Other forces, according to Robertson, include various global issues and world order programs at major universities. Robertson states: "Consistently, the view is futurist, applying alternative visions, imaging, and other fanciful means of exploring the promised globalist world-view which they believe is just ahead of us. Supporting the research and development of all these programs are some 150 foundations, funding agencies, and research councils, ranging from Amnesty International to the World Future Society." Specifically mentioned villains include Richard Falk, Norman Cousins, Fritjof Capra, Willis Harman, the New Age world religion, the UN treaty on the Rights of the Child, and "the forward thinking plans of the Club of Rome—the notorious pro-death group that preaches the doctrine of zero population growth." The one thing that utopian dreamers always omit, says Robertson, is the sinful nature of man. Peace will only come when its source is following from the benign influence of Almighty God. "There is absolutely no way that government can operate successfully unless led by godly men and women operating under the laws of the God of Jacob." Robertson has formed the Christian Coalition to rebuild the foundation for a free, sovereign America and to wage the "epic struggle" between "people of faith and people of the humanistic-occult sphere." [Robertson, P. (1991, September). *The New World Order*. Dallas, TX: Word Publishing.]

Implications

We should note that Robertson heads a fairly sizable media empire, and hosts "The 700 Club" on TV, seen in 86 countries. *The New World Order* was #1 on the Publishers Weekly Religious Bestsellers list and among the top ten on the secular nonfiction bestseller list. Robertson exemplifies some of the forces opposing a comprehensive foreign aid program, though there appears to be unprecedented opportunity to facilitate the development of democracy around the world. Economic problems are another force that appears to be nudging the US toward isolationism.

However, efforts such as Operation Restore Hope run counter to isolationism. The global leadership exhibited in the last days of the Bush administration, and the generally bipartisan support it has received may bolster the role of colleges and universities in preparing leaders with a global perspective for an increasingly politically and economically connected world.

TOOLS

This issue, we'll look at JMP (pronounced "jump"), the SAS Institute's Macintosh-based tool for exploratory statistical analysis (with an IBM compatible sibling in the pipeline).

But first, a word on behalf of software compatibility. As computer users and managers of computer users, we must push for standards that insure that Macintosh users and/or PC users will be able to swap files, either on disk or over a network. The products are there; they cost no more than those that are limited to a single operating system, and they are, generally speaking, among the easiest to learn and use. File translation programs are a useful and necessary evil, but only that. As a corollary, when you require people to use a word

processor or spreadsheet, make certain that they also know how to use and produce "foreign" or exchangeable files. An office worker who is a slave to DisplayWrite and doesn't know how to save a file in a format that an equally enslaved WordPerfect user can use is guaranteeing hours of lost productivity as surely as if he or she were taking four-hour lunches. File exchange is so important, particularly among those of us who collectively produce documents, that I will try to attend to ease-of-sharing with the same compulsiveness I give ease-of-use in these reviews.

Now the review. Even if designing a spreadsheet no longer induces the computer equivalent of watching your feet while you learned the Foxtrot, you are still in the minority if you can attack data analysis or database construction with the same zest and familiarity as building a serious sandwich.

With JMP 2.0, SAS has created the computer equivalent of Arthur Murray's footsteps-on-the-floor for statistical analysis. Given almost any set of data, from almost any other program, or entered directly into JMP, you can be investigating those numbers for meaningful patterns in minutes, even if you are a trained statistician. (That was not a typo. I'll explain in a minute.) You accomplish this by interacting with visual representations of the numbers, such as bar charts and rotatable clouds of data-points hanging in three-dimensional space. Say you have a data file on the demographics of your student body, with a record for every student. The records themselves are displayed in a table, or spreadsheet format. Every row is a student, every column is a different variable. Declare the gender and financial support columns to be Y variables just by clicking the Y at the top of each of them with your mouse, then use a pull-down menu to produce a set of bar charts. The results show the relative proportion of males and females, as well as the distribution of students across various levels of funding. "But" say you "is the distribution of funding equitable between men and women?" To see the relative proportions, click with your mouse on the female bar of the gender histogram. The bar turns a darker shade, and so does the portion of bar of the funding histogram that represents female students.

That gives you just a taste of how you begin to interact with your data. You could as easily have selected one or more of the levels of funding and seen how they were represented in the gender histogram. Given a large enough sample, you could have run just about any of the common statistical tests, including *t* tests and Chi-square and determined whether associations were statistically significant. In addition to being able to compare group means, you can perform several regression and curve-fitting routines and analyze categorical data (JMP has one of the most powerful text-response management capabilities around, making it marvelously capable in looking at verbatim or one-word responses to surveys, without having to assign numeric values. And if you do wish to assign numbers to words, JMP can do most of the work without laborious item-by-item coding.) With the same point-and-click ease, you can perform factorial analyses, group and summarize data, and conduct multiple regressions.

By interacting with the graphics, you can create subsets of data and save them as distinct files (all students with preschool children from outside the immediate area, for example) and analyze those data separately. Meanwhile, you will be producing results tables that can be sent directly to your computer's printer or manipulated by Macwrite or a compatible program, including slidemaking software. (SAS, you should add presentation-creating capacity, or a direct link to Persuasion, et al.)

The few statisticians to whom I have shown JMP have approached it with a silver cross held firmly in front of them with both hands. To a true statistician, there is something at least suspect and possibly felonious about any software that allows a person to go fishing among the data, looking for statistically significant relationships. Especially if that software is intuitive, interesting and easy to use. JMP is all of these. It allows you to produce utterly statistically indefensible reports in a matter of hours, and even more indefensible reports in a matter of minutes. But those reports can just as easily be statistically defensible, either because you use real statistical rigor in formulating your inquiry in the first place, or because you have the self-control never to say anything stronger than "Looks like there may be an interesting relationship here." If you can get the statistician to sit down with you and work with JMP, you'll see an interesting transformation. They'll begin wishing aloud that they had a similarly tactile and visual tool that was made for statisticians, and that would run on a VAX or a PC. Preferably one that used their particular jargon. Help is on the way. Insight for the UNIX operating system, a JMP look-alike product also from SAS, has been around for a while. Insight for Windows and OS/2 is in the testing stage, and may be reviewed here later. The biggest difference between JMP and Insight is that while JMP is a stand-alone application, Insight is an add-on to what SAS calls base SAS. It also requires SAS-Graph if you wish to use the resulting pictures in anything like a slide-making program, or send them to a printer.

The promotional literature, case illustrations and manuals for all the above-mentioned programs are like mini-courses in statistics. For complete descriptions of features, or just a good read, send for the information packages.

Pricing for JMP and Insight can be pretty complex, since it depends on what packages you have already licensed, whether you are a really eligible educational institution, and a host of other variables. Fortunately, the sales people who must explicate the pricing policy are good humored and eager to please. However, it is safe to say that JMP can be purchased for under $700, and probably a whole lot less. One reputable mail-order house is asking $629.

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BOOKS

TAKE ADVANTAGE OF *FUTURE EDGE*

Mark Meredith, University of Colorado, Boulder

Looking forward in only one direction leads to a special kind of strategic blindness. One must scan the horizon constantly to identify the important changes occurring on the sidelines, at the edges. ***Joel Arthur Barker***

Want to gain "extraordinary leverage in shaping your future"? Read *Future Edge: Discovering the New Paradigms of Success* by Joel Barker (Morrow and Co., 1992, 240 pp.). While there is no such thing as a crystal ball, the closest thing to it for discovering your future and the future of your organization is the breakthrough paradigm concept skillfully presented in this work by Barker, who is arguably the leader in popularizing, with all that that entails, Thomas Kuhn's concept of paradigm. Barker has been talking to corporate audiences about paradigms since 1974.

Unlike *The Structure of Scientific Revolutions*, *Future Edge* is about innovation and anticipation. It is also about communication, how the mind works, scanning resources, TQM, trends, opportunity, management and leadership—all revolving around the concept of the paradigm.

"*Future Edge* is about innovation and anticipation."

To Barker, a paradigm is "a set of rules and regulations (written and unwritten) that does two things: (1) it establishes or defines boundaries; and (2) it tells you how to behave inside the boundaries in order to be successful." A paradigm shift involves a change to a new set of rules, a new game.

Paradigms are continually shifting in society, becoming outdated and replaced by new ones, some gradually and some not so gradually. Fundamental, major changes in society—such as environmentalism, deregulation, civil rights, and emergence of information as a key resource—may not be foreshadowed by trends. Instead, "these kinds of [paradigm] changes in the rules create new trends or dramatically alter trends already in place." By understanding how paradigms work, you can optimize strategic exploration. You anticipate the future by "watching for people messing with the rules. This is the earliest sign of significant change." If you do not understand paradigms, you are likely to become trapped into "seeing the world in only one way." You will be unable to communicate clearly in the language of those who hold different paradigms than yours.

There is a great deal of usefulness and applicability of Barker's paradigm concepts and methods to college and university environmental scanning and strategic planning. For example, Barker advises us to write down the major problems that everyone wants solved but feel are not readily solvable, and then (a) proceed to seek possible solutions which challenge the old rules and which may lead to paradigm shifts; (b) watch for paradigm shifts taking place elsewhere; and (c) in either case, be ready to pioneer the shift and develop and enhance it to solve the problem(s). A few such problems facing higher education are as follows:

- Accommodating the changing demographic composition of students and the increase in ongoing adult education demands;
- Reducing the high proportion of fixed costs and fixed curriculum of tenured faculty;
- Funding increased capital costs and the major backlog of deferred maintenance;
- Increasing or otherwise compensating for declining state and federal financial support;
- Reversing the decline in academic productivity;
- Recruiting quality faculty.

By adopting paradigm "pliancy" and engaging in "future edge" approaches to doing business, educational leaders could create a tolerance for strategic exploration that could dramatically change the managerial and communication climate. A few possibilities of the resulting benefits would be:

- Breaking down the typical barriers between college and university sectors, their constituencies, legislative bodies, and others;
- Getting better alignment and synthesis of academic and non-academic kinds of management;
- Establishing a more innovative and future-focused attitude among faculty, staff, and students;
- Improving overall management methods and understandings.

I leave you with one quote from Barker: "To be able to shape your future, you have to be ready and able to change your paradigms."

Mark Meredith is Director of Management Information Exchange and Analysis at the University of Colorado, Boulder.

the environmental scanning newsletter
for leaders in higher education

on the horizon

From the Editor

With this edition we inaugurate two new sections: *Trend Analysis* and *Commentary*. Magdalena Rood, editor of *AERA's Special Interest Group in Futures Research and Strategic Planning Interactive Newsletter*, will write the trend analysis section. She has been conducting a Delphi project with AERA SIG members on trends and issues facing education. Beginning with this edition, she will inform us of the panel's analysis of the research, policy and practice implications of key trends and issues, and will, thereby, illustrate the usefulness of this analytical technique.

In the commentary section, as with our lead article, we will print essays on potential developments on the horizon that may affect colleges and universities. We want these essays to be thought-provoking and provocative. Our commentators may disagree. For example, in this edition, Wally Albers (like Ian Wilson in our December edition) argues for increased ties between colleges and universities and businesses, while Chris de Winter-Hebron argues that such ties may lead to conditions that threaten academic freedom. And what could be more provocative than Arnold Brown's (in whose office no computer can be found) argument to beware the technological bandwagon!

No one took up my challenge in the December edition to nominate key issues facing higher education. In each subsequent edition, we want to include an issue brief on a critical issue. Each brief will consist of a statement of the issue, its background, its location on the "life-cycle" (i.e., the cycle beginning with a faint signal giving rise to social expectations about the issue that then may get on the political agenda leading to legislative requirements and social/political control), and recommended courses of action for educational leaders.

Like our section on trend analysis, issue briefs are important components in issues management. Bill Ashley and I will conduct a seminar on issues management for North Carolina community college presidents in the UNC-CH Institute for Academic and Professional Leadership's executive management program next month. With the permission of seminar participants, I will list the issues raised by them in the April edition. We will begin our issue section with a brief on one of these issues. (Or on an issue that you nominate. The challenge remains!)

Issues management is an effective tool that you can use to anticipate potential problems or opportunities, thereby gaining more lead time to position your organization in a turbulent environment. If you would like to know more about this tool, consider attending a preconference workshop on issues management that Bill and I will present at the July meeting of the World Future Society. If you would like to know more about

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IF YOU'RE ON THE BANDWAGON, JUMP OFF NOW!

Arnold Brown, Chairman
Weiner, Edrich, Brown, Inc.

Remember George Orwell's *1984*? Remember Big Brother? Now, think of the Rodney King case. What we have instead of the omnipresent, omnipotent Big Brother is a multitude of Little Brothers—the people keeping an eye on the authorities. And the ubiquity of the camcorder—now in more than 15% of U.S. households—will accelerate that unpredicted trend.

That's just one example of a remarkable conseque..ce of the revolution in information and communications technology. Most of the predictions made at the start of these revolutions are proving to be equally erroneous or incomplete. Computer development is another example. Computers have not become the overwhelming centralizing force they were predicted to be; instead they are contributing to decentralization, fragmentation, loosening of boundaries and greater individual autonomy.

The world is being re-ordered along lines defined, not by geography or governmental authority, but by telecommunications. When information is the most important resource in the world—and the least subject to control—geography and sovereignty become increasingly less relevant. Networks are everything.

One of the most universally accepted predictions was that computers would impact hardest on those least skilled—the illiterate and the innumerate. What is happening instead is extraordinary and completely unexpected: because it is proving so difficult to "smarten up" the workforce, we are instead "dumbing down" the technology. The simple fact is, it's cheaper to do the latter than to do the former.

Computers now provide employment opportunities for illiterates, innumerates and people who can't read English. Forklift drivers, for example, get directions from talking computers; fast-food restaurant cashiers punch pictures rather than numbers on their registers. Virtual reality, now in its infancy, will soon enable an unskilled, unlettered laborer to perform the complex task of operating a construction crane (and in doing so, allow a $7 an hour worker to displace one who makes $35 an hour).

Because these are such uncertain times, we may be more prone to accepting conventional wisdom. It can be so comforting to accept what others believe, say and do. But if this

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tumultuous age of change tells us anything, it is that there are no experts on the future. And because the stakes are so great, academic conformity founded on baseless predictions about the development and consequences of technology can have devastating long-term impacts.

Right now our schools—K-12 and higher education—are universally using a curriculum whose underlying premise is the need for people to become technologically literate. It is widely believed that the future masters of the universe will be those who have computer skills. Bah, humbug.

It is becoming increasingly clear that true technological literacy lies not in knowing how to operate computers (which will continue to be "dumbed down"), but in knowing how best to use the superabundance of information they generate.

Beware of all predictions. The consensus of experts is that office machinery will create a huge demand for people with the mechanical and electronic competencies necessary to repair all those copiers, faxes, computers, etc. And all the community colleges and vocational schools have jumped on the bandwagon to offer courses in office machine repair to unsuspecting youth. But every office machine manufacturer is developing machines that will be able to diagnose and/or repair themselves. What kind of a future are you training those young people for?

Academia is often criticized for its slowness in responding to change. In this case, however, educational institutions may have been too hasty. I would suggest that skepticism become more prevalent. Constantly ask "what if?" Constantly look for countertrends. Constantly look at not only what the producers of technology are saying but what the users of it are actually doing. Otherwise too many young people in the future will find themselves trained for a world that never comes about.

"Beware of all predictions."
—Brown

TREND ANALYSIS

Magdalena Rood, Editor, *AERA SIG: Futures Research and Strategic Planning Interactive Newsletter*

The American Educational Research Association's Special Interest Group on Futures Research and Strategic Planning has an ongoing discussion about the potential impact of current trends and emerging issues on educational practice, research, and policy. The intent is to stimulate discussion on the future of education and to generate useful insights about issues management strategies. In this column I will describe the research, policy and practice implications at national and local levels of key trends identified by SIG members in a three-round Delphi. The first key trend is, ***educational theory and practice is shifting from teachers as "dispensers of knowledge" to "facilitators of learning."***

Implications of the Trend for National Initiatives

Research:

- Compare the effectiveness of instructional methods used in the creative and expressive arts with the methods used for conventional (academic) subjects.
- Continue R & D of multimedia curricula and technology.

Policy:

- Create incentives for government employees to take distance-learning courses.
- Create tax incentives to institutions and companies to reduce the cost of hardware and courseware for educational agencies.
- Regulate network access costs to promote educational and interdisciplinary networking.
- Resolve copyright issues related to what is produced online.
- Adopt the notion of social critical thought as a guiding philosophy of schooling.

Practice:

- Implement teacher and administrator training programs to reduce resistance to new instructional strategies such as interactive TV, computer-based multimedia programs, and distance-learning technology.
- Stop rewarding teachers for "dispensing knowledge!"

Implications for State or Provincial Initiatives

Research:

Answer the following questions:

- Do students learn as much, less, or more, through interactive technology mediums than through traditional classroom education?
- How much classroom management or discipline is needed in distance learning programs? Under what conditions, if any, is distance-learning more effective than traditional classroom learning?
- How much time do students and teachers devote to distance learning vs traditional classroom instruction?
- What is the relationship between forms of school governance (organizational structures) and teaching/learning styles?

"Outlaw practices like standardized and competitive testing that favor the 'dispenser of knowledge.'"—Rood

Policy:

- Outlaw practices like standardized and competitive testing that favor the "dispenser of knowledge."
- Provide salary incentives for teachers to train in the use of technology alternatives .

Practice:

- Allow in-school testing of technology alternatives (interactive TV, video computer, audio multimedia) to traditional classroom education.
- Provide training and technical assistance to reduce resistance to new content delivery modes.
- Support residencies in schools by a variety of creative and professional people, (i.e., architects in schools, science fiction writers in schools, etc.)

Implications for Local Initiatives

Research:

- Conduct school and community based action research of the critical/emancipatory kind, not the technical/empirical kind.
- Identify better teaching methods and protocols in the

interactive use of technology.

Policy:

- Support alternative modes of teaching.
- Train parents to be "facilitators of learning" too!
- Develop networking consortia to reduce on-line and technology prices.
- Outlaw practices (like standardized and competitive testing) that favor the "dispenser of knowledge."

Practice:

- Train teachers to teach using a variety of distance-learning technology alternatives. Teach courses in information organization and management.

Key Trend: Growing numbers of school-aged children come from non-traditional homes and communities. Related Trend: Increasingly, children and their families are in need of health care and social services.

Implications for National Initiatives

Research:

- Assess the needs of families, and develop approaches that build family unity, a sense of community, and encourage people to tackle problems together.
- Identify the characteristics of programs that successfully address the problems of at-risk children and their families.
- Evaluate the impact of early childhood programs on the subsequent learning performance and living conditions of at-risk children.

Policy:

- Formulate an integrated family policy, doing away with current separate welfare, education, and health policies, consolidating programs and funding streams.
- Develop incentives for inter-agency and community collaboration efforts, such as community schools, that integrate social, health, and educational services.
- Provide funds to compensate for differences in the ability of the states to meet the educational needs of at-risk children.
- Mandate equal access for all children to quality social, health, and educational services.

"Formulate an integrated family policy, doing away with current separate welfare, education, and health policies, consolidating programs and funding streams."
—Rood

Practice:

- Provide information, training, and technical assistance to promote local development of community schools where facilities may be used to educate children and also to provide services such as parenting skills training, early childhood education, after school and latch key programs, drug abuse and gang intervention, literacy programs, intervention programs for the homeless, support and intervention programs for the abused and the abuser, counseling for families and youth, and job opportunities.
- Establish funding priorities for services that address the needs of children and their families with respect for their cultural and ethnic differences.
- Implement programs to manage health and educational information for migrant students who cross state lines and must be served by agencies and schools in a number of different locations.

Implications for State or Provincial Initiatives

Research:

- Assess needs of families within the state. Identify programs that successfully address these needs. Support the spread of such programs.
- Evaluate the impact of early childhood education programs on at-risk children and their families.
- Conduct a cost-benefit analysis of public schools providing day care services to children 1 - 4.

Policy:

- Change school funding formulas to aid early childhood programs provided by school districts.
- Create incentives for state-wide and local inter-agency collaboration efforts that work on problem areas such early childhood education, parenting training, latch key and after school programs, drug and gang intervention, literacy, homelessness, etc.
- Create incentives for the development of community schools that integrate social, health, and educational services and thus become focal points for community activities.

Practice:

- Provide regulatory exemptions, information, training, and technical assistance to help local districts implement commu-

nity schools, integrating social and health service, before and after school programs, and other programs needed by at-risk children and their families.

• Demonstrate state-level commitment to alleviating poverty and supporting families by creating inter-agency collaboration committees, councils, or task-forces to develop action plans, establish quality standards, and oversee service delivery.

Implications for Local Initiatives

Research:

• Evaluate the impact of early childhood programs on at-risk children and their families. Compare the quality of programs offered by public and private providers.

• Assess community needs and the availability of local programs, such as early childhood education, parenting training, latch-key and after school programs, drug and gang intervention, literacy, homelessness, etc.

• Study the effects of alternative schooling arrangements such as longer school days and year round schedules on achievement.

Policy:

• Create incentives for inter-agency and community collaboration to provide daycare services for children.

• Promote collaboration among social, health, and educational services to ensure access for all children.

• Fund longer operating hours for school buildings to allow diverse uses of the facilities.

Practice:

• Universities need to institute preparation programs for day-care and early child education workers.

• Implement inter-agency collaboration programs to develop necessary support structures that will improve access to social, health, and educational services.

SOCIAL

Women in charge

In 1970 women headed 21% of households; in 1988 28% of the 91 million households in the United States were headed by women. Another 15% of households are headed by men and 57% by married couples. By 2000, women are projected to head 29% of households, only a moderate increase.

Within the female-headed households there is much diversity. One-third of women who head households have incomes below the poverty level. Median income for female-headed households in 1987 was $14,600, compared with $24,800 for male-headed households. Median income for white female heads of household was $17,000; $9,700 for African-Americans; and $10,200 for Hispanics. Widows account for 38% of female-headed households, falling from 55% in 1970. A majority (52%) of these women live alone. Only 25% are single parents with children under age 18; another 12% of these households have adult children. The remainder have their relatives or non-relatives in their households. Spending patterns, entertainment and travel behaviors, and earning potential are as diverse as the group itself. These variables may change with the flux of the group because individuals may move in and out of this subset of the population as they mature, marry, divorce or are widowed, and remarry. However, the percentage of female-headed households is expected to remain fairly constant to the year 2000. [Women in charge. (1989, September). *American Demographics*, pp. 27-29.]

"Median income for female-headed households in 1987 was $14,600, compared with $24,800 for male-headed households."

Implications

As more women (a larger percentage of the population) become heads of household, the response to their specific needs becomes more critical. The traditional family, and the support system implied thereby, will exist for fewer and fewer people in the future. Therefore, support systems from other areas of society, including higher education, can be expected to increase.

The conditions of the national population are generally reflected in the subset of females who head households. They vary in age, race, income level, and number of dependents. They have skills that are invisible to traditional evaluation methods. We should focus on these skills and how they translate into job opportunities.

Time and energy spent in customizing programs for women can pay off in increased enrollment. Increasing the self-confidence and the earning power of women, in turn, increases the overall economic health of the country.

[Editor's note: this item was contributed by Sylvia Pierce, Fayetteville Technical College.]

U of California accepts racially delimited scholarship bequest

The University of California Board of Regents recently decided to accept a scholarship bequest for "very poor Caucasian American scholars." The acceptance of this bequest reflects a major change in policy regarding racially delimited bequests and marks the end of the color-blind ideal. Years ago, racially discriminatory funds were readily accepted by the University with no questions asked. However, after the civil rights revolution of the 1960s, the University decided to continue to administer the old racially delimited bequests, but to discourage the acceptance of any additional bequests. Five years later, the university took a tougher stand on the racial issue. The racial restrictions of old bequests were ignored and new bequests that contained racial restrictions were not accepted.

By 1977, affirmative action replaced color-blindness as the new Zeitgeist. The University accepted racially restrictive donations as long as the University could find unrestricted funds to match the restricted funds. However, now fifteen years later, the policy has come full circle. The University has accepted a bequest that explicitly excludes minority groups without seeking unrestricted matching funds.

". . . we are sliding back to the kind of group rights Balkanization that has been tried everywhere from Beirut to Belgrade, with consequences too sorrowful to recount."—Krauthammer

The acceptance of the bequest is consistent with a new national attitude of race-conscious dispensation, most recently evidenced by the racial gerrymandering of congressional districts. While the intent of the congressional redistricting plan is to provide greater representation for minorities in government, the unintended consequence is clear. Segregating blacks in one district inevitably segregates whites in surrounding districts.

What is most tragic about these policies is that "the world has long looked to us as the most successful multi-racial, multi-ethnic society on the globe. Rather than continue the pursuit of the traditional American ideal of common citizenship, we are sliding back to the kind of group rights Balkanization that has been tried everywhere from Beirut to Belgrade, with consequences too sorrowful to recount."

[Krauthammer, C. (1992, October 5). Racist bequest a sign of slide back to exclusion. *The News & Observer*, Raleigh, N.C., 9A.]

Implications

Colleges and universities are now more likely to be offered race/ethnic restricted money. Barring the adoption of IRS regulations forbidding the tax deductibility of such donations, development offices must be prepared to formulate policies regarding accepting such funds. Can we defend a double standard in which funds restricted to minorities are acceptable, while funds restricted to whites are not? How do we respond to this question given the policy to increase diversity on college campuses?

Academic research in the new economy

More than one half of the state colleges and universities in the country are operating on reduced budgets. In order to survive in tough economic times, many campuses are targeting programs for reduction. The process of identifying programs for reduction using a cost benefit analysis is quite simple. However, the politics of the academic environment make it quite difficult to eliminate costly, counterproductive programs. If a cost reform initiative is to be introduced to state colleges and universities, it will likely come from outside, (e.g. from the legislature, trustees or others with strong financial leverage).

Academic research is one activity that does not stand up well in a cost benefit analysis. Academic research absorbs enormous resources with a questionable return on investment. While some academic research has substantial value, vast amounts of research serve no other purpose other than to advance the careers of those who publish it. Robert W. Clower, former editor of *The American Economic Review*, surmised that most of the scholarly papers that came in to him represented "absolute dullness, the lack of any kind of new idea." Clower concluded that "most papers would have been better off if they had not been written."

To Sowell, a well-known conservative Afro-American scholar, the most efficient strategy to improve the quality of teaching is to eliminate the "publish or perish" objective of

academic employment. A drastic reduction in academic research would bring more professors back in touch with the students. The net result would be a better learning environment and a higher quality education.

[Sowell, T. (1992, November 27) 'Publish or perish' slights students. *The Herald-Sun*, Durham, NC.]

Implications

This article represents an increasing perception by the public that the emphasis on research and publication adversely affects the quality of the learning environment. This issue, which has been argued vehemently on university campuses for decades, is increasingly visible on editorial pages and audible in the halls of legislatures. If the argument is not resolved on campus, it may be resolved in the state-house; mandated teaching loads and class sizes may well be the result.

Childless families outnumber families with children

For the first time in decades there are more American families without children in the home than with them. In 1991, 51.1% of family households had no one under 18. The increase is due to the aging of the population and to more and more couples deciding not to have children. Families without children at home have different interests, more free time and often greater financial resources than couples with children. Thus, children's issues tend to become less important to this group. This change in the relative number of childless families may signal a further reduction in the political influence of children's issues. Around the country, the number of senior restricted communities is steadily increasing. In many of these areas, school taxes have been eliminated. In others, it is difficult to pass school bond issues. This places an increased financial burden on a smaller proportion of the community to maintain the quality of children's programs. Compounding this problem is the tight economy and a belief that more public money should not be spent on anything, especially children's programs. The change in the proportion of childless families may help explain why social security and Medicare have lifted many elderly out of poverty, while cuts in welfare and Medicaid have helped make one in five children poor.

[Stone, A. (1992, May 8) Family 'shift': Most households have no children, *USA Today*, 10A.]

Implications

Although the Clinton administration focuses a great deal of attention on children, the shift in the proportion of childless families and the corresponding reduction in political influence of children's issues may affect colleges and universities as well as public schools. Achievements such as papers published, numbers of students educated, or improvement in the quality of education may not serve as effective arguments in budget requests. Instead, colleges and universities may come under increasing pressure to document and demonstrate how their programs have a tangible effect on the community, be it economic, health, or social service related. (Too often "impact" studies focus only on the number of jobs provided by the institution and amount of money spent by students in local stores.) Institutions that can effectively demonstrate a positive impact on the community may have a much easier time acquiring the particular level of support that they need to continue their work.

TECHNOLOGY

Television of the future

The technology of television, including gadgetry, will take a giant leap into electronic sophistication by the year 2000. As early as 1998, the television screen may hang on the wall, like a picture in a frame, and receive transmissions by digital signals (which are used by computers), not the current analog waves that are similar to television's forerunner, the radio. By 2000 interactive television will be commonplace. Magazines, encyclopedias, books, and all other conceivable written material can be accessed from the television screen. Voting can be done by television. On-screen catalogs will flourish because each person will be known by individualized identification (including credit card numbers, address, and phone number). If telephone companies invest the $300 billion required for fiber optic connection, cable companies will reap the benefits by buying into the connection. AT&T is already exploring such partnerships. With fiber optics, television will have the capacity to deliver thousands of channels of video. The final coup before the year 2000 will be to put a computer into each television. High-definition (HDTV) television will offer "wide-screen images, razor-sharp images and crystal-clear sound." And all this from American, not Japanese, technology. [Rogers, M. (1993, January 23-29). A simple guide to the television of the future. *TV Guide*. pp. 27-30.]

Implications

The snowball effect of technology is a reality in the 1990s. Technology has also been made affordable for the average household. Technology is exploding. Technological knowledge is expanding exponentially. Woefully, college and university faculty members continue to use the lecture method as the primary delivery system in the classroom. By 2000, students will be growing up with HDTV and interactive programming. These students will not learn well in a predominately lecture classroom. It is possible that in the future

students will be able to learn more by staying at home than by leaving home to go to school. Even if education can find the resources to invest in the new technology, educational delivery systems and classroom procedures will need to adapt to these dynamic technological advances.

Few areas in the future are as predictable as the issue of the need to insure that educators are proficient in existing technology and the need to prepare them to embrace emerging technology. Research is necessary to determine the use of existing technology in current educational arenas. Studies that assess educators' expertise in existing technologies will be helpful in predicting their predisposition to accept and adapt to new and emerging technological applications. The American political agenda gives lip service, at best, to placing education at the forefront of funding programs at local, state, and national levels. Studies to identify what importance is placed on investing in technology for education, and on investing in professional development programs for educators to learn the appropriate technologies, are critical. [Editor's note: This item was contributed by Sylvia Pierce, Fayettville Technical College.]

"It is possible that in the future students will be able to learn more by staying at home than by leaving home to go to school."
—Pierce

Role of information technology in an environment of constraint

Colleges and universities are being forced to deal with unanticipated challenges because of current economic and future demographic pressures. The challenges that higher education will face include cuts in government funds, endowments, gifts and grants; a drop in student applications as increased numbers of applicants cannot afford tuition; a decline in the quality of students as a consequence of the competition for dwindling numbers of students; the diversion of funds to K-12; and state policy-makers questioning the concept of higher education as a public good.

Information technology will play a crucial role in this new operating environment by altering methods of student evaluation, professors' duties and responsibilities, and the central role of classroom lectures as a mode of instruction. Distance learning systems are likely to become increasingly important as institutions use this technology to enable students to forego lectures and demonstrations in favor of multimedia presentations. Teaching skills could change accordingly and shift from instructional delivery to instructional design. [1990s pose difficult challenges for most colleges and universities. (1992, Fall). *What's Next*, Vol. 14, No. 3., p. 4.]

Implications

As growing numbers of colleges and universities take to the air waves to deliver instruction, competition for students, markets, channels, broadcast licenses, and exclusive rights to offer particular curricula, will greatly intensify between sectors of higher education and between institutions in-state and across-state. Will a new phenomenon appear among faculty—the professor who is a media star/celebrity (e.g., Carl Sagan)? Will faculty careers be influenced by telegenics, as has come to be true of news anchors?

FCC allows TV transmission through telephone lines

The Federal Communications Commission has decided to allow telephone companies to carry television signals on phone lines. The new technology, which allows huge amounts of information to be transmitted instantly, will permit a variety of new services. This would make universal access to new, high-speed computer networks a reality. Currently, transmitting information contained in a single still from a color-television show through a standard telephone wire takes minutes. To deliver these services, standard copper wire used in the current telephone system will be replaced with fiber-optics cable. Although the fiber-optic cable initially installed is expected to deliver television signals, those same lines can provide nationwide linkage between higher education institutions. [Wilson, D. L. (1992, July 29). Host of new college services could follow plan to allow TV signals on phone lines. *The Chronicle of Higher Education*, pp. A13-14.]

Implications

President Clinton is pressing for a nationwide fiber-optic communications infrastructure. The FCC decision will render Clinton's plan much more cost-effective and will accelerate its implementation. Thus, colleges and universities will more easily share information and library holdings sooner than originally expected.

The fiber-optic infrastructure network will enable institutions to reach into any home or office that has telecommunications capabilities, thereby enabling a tremendous growth in distance learning and much greater potential for reaching populations who have difficulty attending traditional classes.

Because of the breakup of the Bell system, some areas in the U.S. have greater opportunities to take advantage of this technology than others. If your phone company is not installing the electronic equivalent to "on and off ramps" to the electronic superhighway, your institution could literally be bypassed.

ECONOMIC

Higher education finance in the 1990s: Hard choices for community colleges

There is good news and bad news in recent data for 34 states on 1990-91 and 1991-92 appropriations to community colleges. The good news is that appropriations to two-year colleges increased by 12.5% in 1991-92 across the 34 states reporting as compared with 2.5% for higher education overall. Indeed, the level of support for community colleges was five times that of higher education as a whole. Declines in state support are primarily in the south and northeast.

The bad news is that state appropriations for two-year institutions did not keep pace with enrollment growth. As a consequence, tuition in public two-year colleges went up 13% in 1992—the largest increase of any sector of higher education. Contributing to this situation is that higher education's total share of state budgets has been declining while support of other public priorities (i.e., Medicaid, corrections, etc.) has increased. One factor that may be contributing to the shift away from higher education and two-year colleges as a budgetary priority for state government is the growing public distrust of all institutions including higher education. [McClenny, K. & Mingle, J. 1992, September. Higher education finance in the 1990s: Hard choices for community colleges. *Leadership Abstracts*, Vol. 5, No. 7.]

Implications

Many two-year colleges, once able to offer a smorgasbord of programs, are faced with decisions of curricular triage and retrenchment. Like other institutions in our society, two-year colleges will have to "do more with less." They must win inter-governmental competition, seek alternative sources of revenue, and restructure themselves by placing emphasis on highly focused missions. Perhaps this is an opportunity to forge alliances with other schools. For example, some community colleges are joining with public schools and the business community to develop full-blown apprenticeship programs.

ENVIRONMENT

The execution of the species

Environmental crisis, or eco-catastrophe, is not merely a remote possibility for the distant future. "Never before—not even 65 million years ago at the end of the Cretaceous period when dinosaurs became extinct—has there been an extinction rate comparable to today's," writes Dave Forman in *Mother Jones*. Currently, one-third of all species living are threatened with extinction within the next 20 to 30 years. Whether scientists agree with Forman or not, there is reason for concern about the extinction rate. Leading field biologists speculate that by the end of the century the only large mammals remaining "will be those that we humans choose to allow to exist." Human beings are having a systemic impact on the life-support system of the earth and need to recognize that we "are only one of several million species . . . [and] have no divine right to treat all other life as 'resources' for our use."

The author puts forth five ideas to help solve the environmental problems facing society today:

1. Stop the environmental destruction now.
2. Establish large ecological preserves.
3. Slow, halt and reverse the growth of human population.
4. Reduce excess consumption.
5. Take individual action.

Implications

Institutions of higher education may take action in most of the suggested areas listed above. Increasing awareness of human overpopulation, recognizing natural species as not contingent on human valuation (instead of as resources designed for human consumption), and teaching "tempered consumption," can prepare future generations for the exacerbated environmental problems they will undoubtedly have to face.

These changes may be reflected in myriad ways: a revised curriculum, the emergence of new campus organizations, or, as is increasingly happening, the development of new academic programs in the environmental sciences. [Editor's note:This item was contributed by Megan Koch, UNC-CH graduate student.]

POLITICAL

Global change in governance and sovereignty

Boutros Boutros-Ghali, the UN Secretary General, writes, "A new chapter in the history of the UN has begun. With newfound appeal the world organization is being utilized with greater frequency and growing urgency." The new era has brought new credibility to the UN, along with rising expectations. The UN machinery, which had often been rendered inoperative by the dynamics of the Cold War, is suddenly at the center of many problems. The end of the Cold War has led to a dramatic expansion of UN peacekeeping services, along with a fourfold increase in costs in the first half of 1992. The UN needs immediately available cash, personnel, and equipment. The question of national sovereignty is a major intellectual question of our time. "Hope has been crucial; achievement is now required. Beyond declarations, beyond position-taking, the time is here to look at ideas as plans for action. Beyond restructuring, the culture of the UN must undergo a transformation." [Boutros-Ghali, B. (1992, Winter). Empowering the United Nations. *Foreign Affairs*, 71:5, Winter 1992-93, 89-102.]

"The various transformations at work in world politics are enlarging, and will continue to enlarge, the UN's centrality in the emergent global order."

Representative Lee Hamilton writes that the UN is experiencing the best of times and the worst of times. It is now within reach of attaining the ideals of its charter; yet it has never been more overburdened and underfunded. The end of the Cold War has vastly expanded UN responsibilities: it has launched 13 peace-keeping operations in the last five years, as many as in the past 40 years. But resources have not kept pace, and the UN must eliminate redundant, obsolete, and questionable programs. The US can help by: 1) building consensus in support of reform; 2) supporting an expansion of the Security Council to enhance legitimacy and to persuade wealthy countries to assume greater UN burdens; 3) helping the UN respond better to crises by enabling member states to provide military units on short notice; 4) paying our UN dues on time and in full; 5) pushing for revision of UN dues assessments so that Japan, Germany, and the Persian Gulf states pay a larger share; 6) exploring new sources of funding such as a "peace endowment" created by public and private donations and taxes on airline travel and arms sales. [Hamilton, L. H. (1992, 1 December). Reforming the post-cold-war UN. *The Christian Science Monitor*, p19.]

James Rosenau, Director, Institute For Transnational Studies, University of Southern California, writes that for more than three centuries, the overall structure of world politics has been founded on an anarchic system of sovereign nation-states that did not have to answer to any higher authority. This state-centric world is no longer predominant. A complex multi-centric world of diverse and relatively autonomous actors has emerged. The various transformations at work in world politics are enlarging, and will continue to enlarge, the UN's centrality in the emergent global order. As its roles expand, the opportunities for the UN to serve as an agent of change seem bound to multiply. What then can be done to maximize the UN's chances of functioning as an agent of positive rather than negative change? Rosenau offers these recommendations: 1) reconsider the sovereignty principle so that it is subject to more than one interpretation; 2) enhance UN authority by establishing a permanent UN mission in the capital of every UN member, which makes services available to individuals and organizations in the multi-centric world, as well as to host governments (services would include information about peacekeeping activities and the work of various technical agencies); 3) consider addition of a people's assembly to the UN, in which representatives would be directly elected (but such a legislature might be counterproductive); 4) create a global "Peace Corps" service of volunteers to cope with UN system overload; 5) consider new procedures for selecting future Secretary Generals: 6) enlarge the Bully pulpit by creating, say, five new Deputy Secretaries General (or UN Ambassadors-at-Large) who would visit national capitals and engage chiefs of state and other key elites in dialogue. [Rosenau, J. N. (1992, Fall). *The United Nations in a turbulent world*. International Peace Academy (NYC), Occasional Paper Series. Boulder CO: Lynne Rienner Publisher.]

Rosenau and colleague, Ermst-Otto Czempiel, maintain that a world government capable of controlling nation-states has never evolved. But governance is not synonymous with government, and considerable governance underlies the current order among states and gives direction to the challenges posed by various problems. Indeed, governance without government is in some ways preferable to governments that are capable of governance. During the present period of rapid and extensive global change, the constitutions of national governments and their treaties have been undermined by the demands and greater coherence of ethnic and other subgroups, the globalization of economies, the advent of broad social movements, the shrinking of distance by information technology, and the "mushrooming of global interdependen-

cies" fostered by AIDS, pollution, drugs, and terrorism. Much depends on how the characteristics of the global system are perceived: either as the continuing dominance of states or states as a part of a larger new order. There is no clear-cut evidence to support or reject either of these perspectives, and "a new or reconstituted global order may take decades to mature." Rosenau concludes that "the proliferation of governance without government, of access points in a polyarchal world, poses huge new challenges to citizenship in the emergent global order." Increasingly people will have to choose between channeling their loyalties to systemic order or subsystemic autonomy. But tendencies toward a pluralist order may be substantially offset by the centralizing tendencies inherent in worsening environmental conditions, which would encourage a cooperative global order. [Rosenau, J. N and Czempiel, E. (Eds.) (1992, March). *Governance without government: Order and change in world politics.* Cambridge & NY: Cambridge U Press.]

Kenichi Ohmae writes that we are seeing the disappearance of national borders and the emergence of regional states. In Europe, regions such as Baden-Wurttemberg, Alsace-Lorraine, Catalonia, and Wales are emerging. The same borderless phenomenon is taking place in North America: as national borders disappear between Canada and the US, the regions around the five Great Lakes will become very important. Vancouver and Seattle will form an economic region-state to serve as a northwestern gate of North America to Asia. The advantage of forming a southern California region state is quite obvious, and discussion is going on for sharing a San Diego-Tijuana international airport. In Asia, region state formation is a lot slower and is far behind that observed in Europe and North America. Still, Singapore has become the capital of ASEAN and its industrial base has expanded into parts of Malaysia and Indonesia. Hong Kong is in effect the capital of Gwangdong State, and Fuzhou and Taiwan are now forming a region state. If these regions are left to prosper, there will be "20 Singapores" in "Pink China." [Ohmae, K. (1992, 1 June). *The emergence of regional states: The disappearance of borders. Vital Speeches of the Day*, 58:16, 487-490.]

" . . . we are seeing the disappearance of national borders and the emergence of regional states. "

Finally, Walter B. Wriston, former chairman of Citicorp, writes that the information revolution is profoundly threatening to power structures of the world, because the nature and powers of the sovereign state are being altered and compromised in fundamental ways. The dissemination of once closely held information to huge numbers of people who didn't have it before often upsets existing power structures. Pressures on repressive governments for freedom and human rights will grow. As power increasingly resides in the people, the world will become more complex, and we will live "in a kind of international democracy."

Information technology is driving nation-states toward cooperation with each other. It has created a new world monetary standard, an "information standard," which has replaced the gold standard and the Bretton Woods agreements. "There is no way for any nation to opt out of the Information Standard."

"The electronic global market has produced what amounts to a giant vote-counting machine that conducts a running tally on what the world thinks of a government's diplomatic, fiscal, and monetary policies. That opinion is immediately reflected in the value the market places on a country's currency." Information is the preeminent form of capital; the information economy is "intractably global" (which requires compromises of national sovereignty that seemed impossible a few years ago). Global conversations enabled by telephone linkages are expected to triple in the 1990s. [Wriston, W. B. (1992, September). *The twilight of sovereignty: How the information revolution is transforming the world.* NY: Charles Scribner's Sons.]

Implications

We are increasingly becoming a global, interdependent society. Do our curricular programs reflect these changes? Do they give attention to these changes with concomitant implications for what it takes for our graduates to function effectively in this changing world?

We cannot depend upon public schools to prepare entering students for this world. A recent Congressional Institute for the Future report, *International Education for a Global Society* (no date), states that young (aged 18-24) American adults' knowledge of geography rank behind those in Sweden, West Germany, Japan, France, Canada, and Great Britain. Students in teacher preparation programs take fewer international education-related courses, including courses teaching foreign languages, than any other college majors. There is a shortage of foreign language teachers at either the elementary or secondary level in half the states, and 33 states will soon face a shortage of language teachers. In elementary schools, only 17% offer any form of language instruction. In secondary schools, only 10% of the students take four years of language training (one to two years are required). In contrast, Japanese high schools require six years of foreign language study.

What should we be doing? With respect to curricular programs, increasing language requirements is a natural. But how do you stimulate professors to revise their courses to

reflect international concerns? What about workshops/seminars sponsored by the chief academic officer and offered through campus centers for teaching and learning? What about establishing "sister" institutions on various continents, and, via satellite communications, have students and faculty discuss world problems, issues, and the future with their counterparts in these sister institutions?

Government looks to non-profits

Under the new Clinton administration, the non-profit sector will play an important role in the transformation of government, particularly in how the reincarnated public sector operates. The government will forge a strong partnership with non-profits to reduce costs and increase efficiency. Non-profits will be called upon for the generation of new ideas and for evaluating their feasibility. In a campaign policy statement, Clinton indicated that the non-profit sector is one of the primary determining factors in the health and vitality of America's communities. Government at all levels will rely on non-profit organizations to provide certain services more efficiently and more effectively than government bureaucracy.

Clinton brings to Washington a track record of developing non-profit alliances. As governor of Arkansas he was instrumental in the formation of a bank holding company with a non-profit arm. The purpose of the holding company was to spur the state's economy and stimulate new jobs by providing access to financing, capital management and technical assistance. The program was so successful in Arkansas, he now plans to create 100 such banks throughout the United States.

Clinton places high value in the ideas, research, and networks that emerge from the non-profit sector. It is a sector free to explore social innovation, and it provides an independent vehicle for citizens' voice in policy issues. Non-profits can also strengthen new programs backed by government by placing them squarely in the hands of the local community. We anticipate that all major line agencies in the federal government will be staffed with individuals committed to working in partnership with non-profits.

[Cohen, T. (1992, November 15) Leaders expected to lean on non-profits *The News & Observer*, Raleigh, NC, 1F, 3F.]

Implications

The new political environment provides an unprecedented opportunity to participate in the research and development of social policy. Higher education should find government more receptive to new ideas and new initiatives, particularly if the outcome of these ideas and initiatives is administrative efficiency. In this new environment, college and university leaders can have an important role in assisting non-profit foundations and organizations in selecting and evaluating funding proposals and in working with the non-profits to establish and implement a systematic program to address particular social policy issues. It is important, therefore, that college and university leaders volunteer to serve on non-profit boards in order to foster interaction and communication.

"The new political environment provides an unprecedented opportunity to participate in the research and development of social policy."

BOOKS

Thinking for a Living

Reviewed by Walter A. Albers, Jr., Albers Systems, Inc.

Thinking for a Living [Ray Marshall and Marc Tucker, 1992, Basic Books, New York, NY] has its genesis in the work of the Carnegie Forum on Education and the Economy, established in late 1984 under the auspices of the Carnegie Corporation of New York. Marc Tucker was the executive director of the Forum; Ray Marshall, a trustee of the Carnegie Corporation, was a member of the Forum's advisory council. Ray Marshall may also be remembered as Secretary of Labor under president Jimmy Carter. These two gentlemen joined forces to write *Thinking for a Living* in order to present the ideas that grew out of the work of the Forum as an integrated whole to a wide public audience.

The book's premise is simple. Maintaining steady growth in productivity and being competitive in the emerging global economy depends critically on the skills of our people and our capacity to employ highly educated and trained people to maximum advantage in the workplace. However, our industrial and educational systems, the guiding principles of which were formed in the early years of the 20th century and were highly successful for a long time, are now outmoded and indeed harmful in responding to national needs.

The first third of the book persuasively establishes the credibility of the premise. The middle third is devoted to developing pragmatic blueprints for reconstructing our institutions involved in education and training, where education and training are clearly much more than just schooling in the minds of the authors. The final third of the book looks towards the future and explores some strategies.

All institutions of our society come under the authors' scrutiny, higher education included. The authors are critical of the lower than desirable standards of admission to institutions of higher learning, and make the suggestion that these low standards are responsible, in part, for the poor performance of K through 12. They argue that admission standards must be raised and present provocative discussion related to this issue.

I highly recommend this book for anyone interested in acquiring an integrated view of the educational challenges facing U.S. society. The book is well written and very readable. Documentation is thorough. And it dramatically demonstrates why the words "learning" and "working" have become synonymous as we move into the 21st century.

TOOLS

FileMaker Pro 2.0

The mailing label on this newsletter was produced with FileMaker Pro 2.0, a new/old program that is the best reason yet to overcome any aversion to databases that may still linger from earlier exposure to dBase and its ilk. FileMaker has been around for years, so long that some enterprising paleantologist of programming could doubtless find its genetic antecendents on the original Apple. But today it runs on the Macintosh *and* on the PC under Windows 3.0 and later. It's preprogrammed to produce any of dozens of varieties of Avery labels.

I shouldn't dwell on label production, but we need to face the fact that that is one of the most frequent reasons for purchasing database software, and the difficulty of using most databases is the reason that there are so many expensive mailing programs out there. Labels are, of course, just a tiny part of FileMaker's repertoire.

Back when I was a hospital marketing type, I produced a heart-patient registry with an earlier, somewhat harder-to-use version of FileMaker in about a week. Clinical research databases are notoriously difficult because the elements, such as physician names, procedure codes, acceptable ranges, abbreviations and diagnostic categories, change constantly. The beauty of FileMaker even then, and one of its truly outstanding features today, is that a programming tyro can incorporate all those changes without the eye-rolling and teeth-grinding that ordinarily characterize the task. You can ask FileMaker to watch you produce a report by finding certain records (say, all patients who died during open-heart surgery) sorting them by a particular criterion (say, the surgeon's ID code) and summarizing the results in a report (say, by physician, in rank order by mortality rate.) The program will watch you do all that, creating something that the manual calls a script, then it allows you to assign a name to the script and put that name in a menu of standard reports, in about the same amount of time it just took you to read about it, or less. The newest version of FileMaker differs from its predecessors in its ability to show you a clear listing of the elements of the script, permitting you to edit any of the elements in a programming environment so intutitive that HyperCard truly pales in comparison.

But Is It Relational?

Most people with whom I speak have a vague notion about the meaning of relational that can be paraphrased as "If you have two databases with something in common, such as a mailing list of donors and a separate list of the amounts the donors gave last year, but with no addresses, you can use the relational feature to generate a Christmas-card list of the high rollers." If that is what you want, FileMaker will deliver. There are far more ambitious meanings of relational that would be difficult or impossible for FileMaker to achieve, such as updating two different files simultaneously. If these more ambitious uses are part of your plans, they may be achieved via Apple Events, a major operating system breakthrough so loudly heralded and so little used in practice, that one is inclined to believe that Apple should have called them "non-events." Still, talk to Claris technical support; they'll be marvelously helpful and candid about what the program can and cannot do in practice.

The program is virtually self-documenting; just ask it and it will print out a list of all fields and their formulas, or a list of all scripts and their contents. If your glass is never half empty and always half full, this is good news, because it means you can borrow the best features of your earlier work. For example, if you've gone to a lot of effort to create a sophisticated set of reports in one database, and some complex formulas in another, you can type and point and click directly from the printed-out documentation and produce your hybrid. If, on the other hand, you are inclined to begin your wishful thinking before you've even torn the shrinkwrap from the box, you'll wonder why field definitions from several different files can't just be imported into a new one. Ask Claris and they will give you excellent reasons why it is next to impossible, and I suspect that they will continue to do so until they release the version that has the capability. Claris gave me a number of good reasons why they haven't filled yet another glaring (I think) need, the absence of any real graphing ability. I get around this shortcoming by using the Repeat() function with a font like Zapf Dingbats. If you want to learn how, drop me e-mail at Bernard_Glassman@unc.edu. But if you want real graphing, you'll need to link FileMaker to a graphing spreadsheet like Excel or Resolve (not difficult, but tedious by comparison to its otherwise intuitive and pleasant interface) in order to get pictures of those results.

In an environmental scanning setting where multiple people might be simultaneously entering abstracts of articles into a

single database, a network would seem to be a reasonable solution. If you have two Macs of almost any vintage linked to the same laser printer, all you need is a couple of copies of Filemaker and you have a networked database with complete file-sharing. No further software is needed. Any combination of Macs and PCs can be a networked FileMaker system, but PCs will need networking hardware and software.

Room does not permit me to dwell on all the features. FileMaker can store pictures, sounds and even full-motion video. Its greatest shortcoming is its speed, especially across a network. If you are looking for that capability, say in a multi-machine order entry or survey environment, you'll want to make sure that you have the computing horsepower to supercharge FileMaker's performance. But in an institutional research environment, on one to three machines, FileMaker will more than satisfy.

FileMaker Pro 2.0 (Windows and Macintosh)

Claris Corporation

5201 Patrick Henry Drive

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"Learning and working have become synonymous in the lexicon of modern society."—Albers

COMMENTARY

Global competitiveness and higher education

Walter Albers, Albers Systems, Inc.

As we move into the "post industrial period" or the "Age of Aquarius" or the "information age" or the "age of global competition," whatever you want to call it, with all of the attendant rapid change, chaos and upheaval, one thing appears quite clear. Higher education is going to be a focal point of the requirements of the U.S. as we move toward the 21st century.

The preceding statement is reinforced daily in contemporary literature and the various media. Just a few examples follow. Patrick M. Callen, professional educator and former vice president of the Education Commission of the States, writes "Higher education is not going to be exempt from the economic, technical and demographic pressures that are causing every type of institution we have to reconsider how to organize itself to get the job done." Carl Sagan, prominent scientist and author, echos the sentiments of many others when he proclaims that " . . . the American public's knowledge of science is deplorable . . . " and he argues that engineering and science education must become a national priority." Lester Thurow in his recent best-selling book *Head To Head* suggests that "... educational reform must be greatly emphasized if the U.S. is to reverse its slide" and persuasively argues that ". . . the future belongs to the nations whose citizens are best prepared for it." And finally, Ray Marshall and Marc Tucker in their hard-hitting new book entitled *Thinking for a Living* provide convincing evidence that "learning" and "working" have become synonymous in the lexicon of modern society.

The implications of all of the above issues for higher education must be understood in order that institutions of higher learning can chart their paths to maintain, and indeed improve upon, their current position of strength. In contrast to our K-12 system, which is generally acknowledged to be falling behind similar schooling systems in many other industrialized countries, the U.S. is thought by many to have the best system for higher education. It continues to be the envy of the world. But lest we get complacent because of this high regard for higher education in the U.S., let's look at what happens if we choose to stay with the status quo. We will continue to lose ground in math, science and technological development. We will continue to be ineffective in helping our K through 12 education system improve (educating better teachers, raising admission standards, etc.). We will continue to be inefficient in awarding baccalaureate degrees (two thirds of the enrollees in four years institutions fail to get one in 6 years!). Nothing is so good that it can't be improved. We must discipline ourselves to change in the positive spirit of "continuous improvement."

How is a discipline, a policy, of continuous improvement developed? One suggestion is to employ the techniques of Total Quality Management (TQM). Goal-setting, benchmarking, identifying and listening to the "voice of the customer," mobilizing for optimum performance, and a building of a set of performance measures to assess goal attainment, all parts of TQM, are not sacred in the application to business organizations or governmental agencies. These very same methodologies may apply to institutions of higher learning as well.

Another suggestion for developing a discipline of continuous improvement involves a focus on educational productivity and how such productivity can be improved. Higher education is under mounting pressure to monitor, and increase, the time that faculty spend in the classroom. There is a sense that this is an issue whose time has come. Institutions are going to

have to mobilize for increased productivity. But certainly increasing faculty time in the classroom is not the only response to the productivity issue. There are questions about curricular reform and how well the curricula meet the current and future needs of society. In other words, productivity improvements come not only from improving efficiencies, but also improving effectiveness. And we need to remember that in many cases one won't work without the other! Moreover, the public and many politicians are more interested these days in the quality of instruction and educational outcomes than in a simple quantitative measure of time spent teaching. This is an example of the "voice of the customer" that must be heard.

College and university leaders should form alliances with industry. This recommendation is proposed with the following thoughts in mind:

- industry has been a leader in the application of TQM and could provide practical guidance to higher education in the implementation of TQM techniques;
- industry depends on productivity improvements for survival and has much pragmatic experience to share;
- industry's recent "right-sizing" efforts in order to get "lean and mean" may have some application in higher education;
- and finally, industry can prove to be a great resource for identifying the "voice of the customer" for higher education.

Academic freedom endangered?

Chris de Winter-Hebron
Academic Director, H + E Associates, Ltd.

Although some of the root ideas of academic freedom go back to the humanists of the 16th Century Renascence, the concept in its present form is essentially a 19th Century one. For research, it turns on Von Humboldt's 1803 definition of the research scholar's work as being conducted "*im Freiheit and Einsamkeit*" ('in individual freedom and solitude'). For teaching, it turns on Newman's defense in *The Idea of a University* of the right if the individual scholar to decide freely what and how to teach. Both of these ideas assume the existence of independent higher education structures organized to provide a socially protected environment within which individual scholars can work unconstrained by social, economic, or political constraints.

This assumption is threatened by several developments. First, research and teaching are increasingly team activities, constraining the freedom of individual decisions. For example, team research projects continue to provide an increasing proportion of submissions to both British and Australian research councils. The use of project teams in higher education curriculum design is now becoming widespread not only in the UK, but also in Australia, Hong Kong and South Africa. The most recent institution to adopt such an approach is UNISA (pilot scheme begun November 1992), an educational organization serving distance learning students throughout the whole of southern Africa.

The second development is the increasing cost of teaching and research; a concurrent trend where decisions are increasingly dependent on the attitudes and preferences of sponsors. For example, Cambridge University's most recent (January 1993) funding appeal letter quotes the cost of a single DNA sequencer for the Brain Research Project as £60,000 ($95,000) and the cost of an electron microscope complex as ten times that amount—neither one an item in the "big league" of, say, a nuclear particle accelerator. The same appeal also urges the importance of protecting that University's academic freedom by raising these sums from its own alumni, a clear indication that the Development Office fears the consequences of having to seek external funding for such projects.

The third development is the increasing proportion of research and teaching activity directly commissioned by national governments. This trend in broad scope includes a movement towards detailed accountability of academic institutions to government funding providers, in terms of both efficiency (value-for-money unit cost performance indicators) and effectiveness (measurements of research or teaching quality performance to externally laid-down standards). The U.S. quality assessment movement, involving not only the regional accrediting bodies, but funding bodies of such states as Tennessee, slightly antedated the development of the UK's Academic Audit Unit and the subsequent Higher Education Quality and Funding Councils. Parallel developments have since taken place, inter alia, in the Netherlands, Belgium, Hong Kong, and Australia, and are currently under discussion in such nations as Germany and South Africa.

The detail into which constraints go should not be underestimated. The HE Funding Council for England currently employs no fewer than 64 accountability performance indicators, including such detailed items as departmental telephone costs per full-time equivalent student. The same body's quality performance survey is set to examine all aspects of instruction, subject-group by subject-group, including classroom visitation by teams of the Council's officers using a formal scoring sheet. The Belgian scheme is governed by a detailed set of Ministry regulations that went through no fewer than 16 separate draft revisions. The Australian Higher Education Council's National Quality Assurance Committee (the most recent example of this trend) not only has power to conduct similar interviews and visits, but can also make use of existing nationally based research and statistical data in reaching its conclusions.

The second new feature of this trend is the increasing development by various national governments of national strategic missions for higher education, to which individual institutions are expected to conform. Many of these are to be found in the newly developing nations. A paper by David Chou to

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the 1992 ISSED seminar in Czechoslovakia outlined such a strategy (linked to manpower planning) for Taiwan. Lagos University's agriculture department as early as 1983 was required by the Nigerian government to service the "Feed The Nation" scheme. Zimbabwe and Botswana both have national strategic missions for their (single) national universities involving servicing national development. And only last October, in a SAARDHE conference keynote address, Jonathan Godden, the ANC's deputy education spokesman, proposed a policy of "diversified higher education institutions" in which selected South African universities would have an official international academic role, while others would have a specific nation-building mission.

As development needs become more urgent and funds scarcer, we may expect further countries to go down this more prescriptive road. Already India's *University News* has run an influential article by A.L. Mitra (President of the Association of Indian Universities) calling for the business education sector to become a national educational development resource.

The third of the new features—almost, indeed, a new trend in itself—is the steady move of higher education round the world into the hands of business corporations.

> "... there is simply no way that [these trends] can be reconciled either with scholarship ... or with teaching material and methods - freely selected by the individual lecturer."—de Winter-Hebron

I am not merely referring to corporations endowing chairs or courses, nor am I referring to the legislation—in UK for example—that has made colleges and universities ever more closely resemble businesses in status and character (though these are part of the trend too). I am rather referring to a trend towards establishing entire institutions of higher education as divisions of major corporations, with the avowed intent of training, educating and conducting research for the corporations' direct benefit and in accordance with their agenda(s). This trend is now remarkably widespread internationally. To name only a few examples, the U.S. has Motorola University and Embry-Riddle Aeronautical University; in Britain we have the British Gas John Dyde Training College; Germany has the Bundespost Fachhochschule Telekom Berlin; South Africa has the Unidata Corporate College. Other instances have also been reported recently, including some from Japan.

All these trends may well produce a system of higher education more suited to world social and economic conditions in the early 21st Century than anything that has gone before. But there is simply no way that they can be reconciled either with scholarship pursued "*im Freiheit and Einsamkeit*" or with teaching material and methods freely selected by the individual lecturer.

From the Editor, from p1

other tools and techniques of anticipatory management, consider attending the global change seminar cosponsored by the UNC-CH Program in Educational Leadership and King Alfred's College, Winchester, this summer on their campus, one hour from London. Please call or write me for details.

A number of people have inquired about site licenses to reproduce and distribute copies of *On the Horizon* to planning committee members or other campus leaders. Please know that we have worked out a policy on site licenses. For $60 per year, licensees may reproduce and distribute up to 20 copies of *On the Horizon* within their organizations. If you want a site license, please let me know.

Finally, congratulations to Sylvia Pierce, Fayetteville (NC) Technical College and to Megan Koch, UNC graduate student, for being the first readers to have an abstract selected for publication. Let their examples be inspirational! Your contributions are welcome. Remember to provide a copy of the article you abstract and full bibliographic citation along with a statement of implications.

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ESSAY: EDUCATION IN THE INFORMATION SOCIETY

Peter C. Bishop, Chair
Studies of the Future
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Education prepares students for the future. Educational leaders committed to achieving their mission must have a clear vision of the future that compels their organizations to break with the past and to offer an education truly in touch with the future.

One of the most common visions of the future is the coming of the information society. Daniel Bell coined the term "post-industrial society." Alvin Toffler popularized the concept in *Future Shock* and in *The Third Wave*; and John Naisbitt picked up the theme in the 1980s in two editions of *Megatrends*.

The idea is simple, yet profound. Civilization was transformed first by agricultural technology, then by industrial technology; we are now experiencing the effects of information technology—transforming work, politics, popular culture, religion, family life and much more.

> Change is afoot, but not on the grand scale advocated by Toffler and Naisbitt.
> — Bishop

Table 1 lists some of the key changes in the shift from agricultural to industrial society. The economy shifted its focus from food production to manufactured goods. Serfs became factory workers who worked for money and thus earned their place in society rather than having it ascribed them at birth. Likewise, industrialism introduced fossil energy and machine power and was associated, in its later stages, with the creation of individual rights, the Protestant religion and the democratic nation-quite an impressive list, and all in barely 200 to 300 years.

Table 1. Transformations Brought About by Two Technologies

Category	Agricultural Technology	Industrial Technology
Product	Food	Goods
Occupation	Serf	Factory worker
Status	Ascribed (fixed)	Achieved (mobile)
Exchange	Food	Money

Similar changes should accompany the shift from industrial to information society. New industries are developing—computers, software, communications, media, professional services, health care. As a result, manufacturing employment is declining, particularly in the U.S., as workers move to information and service jobs. The world is now connected with communication links, forming a truly global society.

But where is the change in the form of the economy and government? Capitalism and democracy, far from being replaced, are ascendant. How much change is there in family, religion, the status of the individual in society? It may be too early to tell, or maybe another form of information society is appearing instead. Change is afoot, but not on the grand scale advocated by Toffler and Naisbitt.

I propose a more modest form of the information society that seems more consistent with the changes that are actually taking place. This form is not a replacement of industrial society, but a different form of industrial society. The alternative form is based on the long-wave theories of Joseph Schumpeter and Nicholai Kondratieff. They found a pattern in industrial prices, which marked a 50-60 year cycle of boom-and-bust capitalism. (Karl Marx had found the same cycle and used it as the basis for his forecast that capitalism

Continues on p 2

would self-destruct under cycles of increasing magnitude.)

Each of the historical technologies was so far superior to the technology it replaced that it touched off a wave of economic growth based on rising productivity. Rail replaced the horse drawn carriage for overland transportation. Without it, the American West could never have been settled. Steel replaced iron, and skyscrapers rose in the cities. Oil replaced coal, and the giant industries of the 20th century were born—oil, auto, aerospace, and chemicals. Look at the *Fortune* 20. Most of the largest U.S. firms today are from those four industrial sectors. The superhighway system, the aircraft carrier, the Saturn V rocket, and plastic fibers were the result of their dominance. Will they be on the list in 30 years? Most definitely not. We will have oil companies for a long time, but they will not lead the economic growth of the next wave. Computers, telecommunications, media, and professional services—those are the industries of the next wave. That is where the gains in productivity are being made today, laying the foundation for the next phase of economic prosperity.

If microelectronics offers such promise for the information society, why do we have the economic problems we do? The answer is that we are not there yet. Prosperity requires more than the invention. It also requires the application of those inventions to everyday life—a result that takes considerably longer. The fundamentals of the automobile had been invented by 1910, but it wasn't until after World War II that the automobile entered everyone's life. The transformation required not just automobiles, but paved roads, maps and signs, service stations, and superhighways. The infrastructure for the information society is an important step in transformation and it is not yet in place. The superhighways of the future, high capacity *fiber and wireless communication, are now* being laid. Once they are in place, along with easy-to-use, intelligent interfaces, productive software, and computers that can talk and listen, then the coming boom will be upon us. In the meantime, we are left to suffer the burdens of transition.

> Doing what you are told is not a valued behavior in the information society. Figuring out what to do is. Coming to work on time and following a schedule is not required in the information society. Using your time for the greatest benefit is. Doing your job isolated from coworkers is not effective in the information society. Working together in diverse and flexible teams is. Characteristic after characteristic, the information society requires knowledge and skills that are different from the factory society.
>
> — Bishop

One of those burdens is the need to adopt a new set of values for this phase of industrialism. The energy of society was devoted to size—big projects like the Alaska pipeline and Apollo program. The more energy you burned, the more money you made. The new technology is small, not big. It values precision over power, intelligence over brute force. In order to exploit that technology, we must down-size, conserve, recycle—squeeze productivity from every ounce, every minute, every BTU. We are told to coordinate with others, work in teams, think before acting, plan before building. The term for all this is *quality*—the movement that is transforming every aspect of American business and soon American life itself.

This value shift translates into a change of the requirements for education. Public education was developed during the early days of the older form of industrial society. Factories needed workers. The only available supply were displaced farmers and plantation workers. But these people were hardly effective factory workers. They did not show up on time; they did not do what they were told; they could not read simple instructions or write in their daily logbook. They were skilled at farm work but not factory work. The schools, created for this purpose, engineered their transformation marvelously.

But will these same graduates be prepared for the information society? Doing what you are told is not a valued behavior in the information

Continues on p 4

From the Editor

As you will note, we are continuing to experiment with our format. In this edition, we have changed our cover and have added an issues management section, called *The Situation Room*. Richard Heydinger, who has been involved with an issues management program at the University of Minnesota for some time, begins with an explanation of issues management and illustrates Minnesota's use of the tool vis-`a-vis the animal rights issue.

We are also experimenting with our STEEP section. In this and in subsequent editions, Asterios Kefalas, Professor of Management at the University of Georgia, will summarize a number of trends in the economic sector and their implications. He uses an essay format, as opposed to the abstracts-of-articles-with-implications format, as is the case for the other sectors in this section.

We are in the process of appointing editors for each of the STEEP sectors. The objective is to assign experts to assume responsibility for their particular sector in each edition. We strive to meet the quality movement's motto: continuous improvement. Our vision is that *On the Horizon* will be considered "must" reading for leaders in higher education. We ask you to let us know how we are doing, and to give us your suggestions for improvement.

We have instituted a procedure whereby our international subscribers can receive *On the Horizon* via Internet. U.S. subscribers may also receive this service by sending Bernard Glassman, our managing editor and in-house computer guru, e-mail to his Internet address: Bernard_Glassman@unc.edu.

A note about costs: We instituted an individual subscription rate of $19.50 for people who do not have access to institutional budgets. (This rate covers a bit more than the cost of printing and mailing, but not much more.) The institutional rate of $38.50 or the site license rate of $60 enables us to expand the subscriber base via marketing to members of various professional organizations.

A word about site licenses. A number of subscribers have sent $60 checks to "upgrade" to a site license in order to reproduce and distribute *On the Horizon* to their colleagues. If you want to upgrade, please call us and we will invoice you for the difference in what you initially paid and $60.

A special request: if you have been getting more than one flyer advertising *On the Horizon*, you can help us if you will forward the extras to your colleagues. We appreciate your assistance. JLM

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society. Figuring out what to do is. Coming to work on time and following a schedule is not required in the information society; using your time for the greatest benefit is. Doing your job isolated from coworkers is not effective in the information society; working together in diverse and flexible teams is. Characteristic after characteristic, the information society requires knowledge and skills that are different from the factory society.

The effective schools of the future will do more than just change their curriculum to include computer literacy and other basic skills. The schools themselves must learn to work according to the values of the new information technology —centers of empowered professionals working to achieve a common vision and ambitious goals, graduating skilled and satisfied students. Schools must plan, execute the plan effectively, and efficiently graduate students with the technology transformation knowledge and skills. Schools must devise new measures of their results and continuously improve their processes.

In many ways, the virtual corporation will disobey all the rules of organizational design textbooks of the past. It will have no central office, no organization chart, no hierarchy, and no vertical integration. Its strengths will be power, fluidity, and flexibility.

These are the tenets of the new wave of change in America— the quality movement. It is no coincidence that quality and information technology are adopted simultaneously. The quality principles require forethought, planning, precise execution, and an appropriate system to measure results—all information processes. Companies and schools that learn to operate according to this new philosophy will thrive in the future. Those stuck in the old paradigm are doomed to fail.

SOCIAL

The Virtual Corporation

The use of the word *virtual* in the concept of how tomorrow's corporations will be configured is taken from the computer industry, but is not related to the computer term *virtual reality*, which means, in one sense, that computers provide instantaneous, split-second processing and immediate access of *real world* data and information, and in another sense, that computers generate a three-dimensional simulated environment that is sufficiently like actual experience that the participant *feels* that he or she is really *there*. Rather, the term, virtual, comes from an earlier term, *virtual memory*, which described the process for making a computer act as though it had more storage capacity than it in fact did.

According to John A. Byrne, "Today's joint ventures and strategic alliances may be an early glimpse of the business organization of the future: The Virtual Corporation. It's a temporary network of companies, even erstwhile rivals, that come together quickly to exploit fast-changing opportunities."

Companies of tomorrow can be expected to share costs, skills, and market access, with each company contributing its key capabilities or *core competencies* to the venture without forming permanent alliances or merging through either friendly means or hostile takeovers.

In many ways, the virtual corporation will disobey all the rules of organizational design textbooks of the past. It will have no central office, no organization chart, no hierarchy, and no vertical integration. Its strengths will be power, fluidity, and flexibility. Says John Sculley, Chairman of Apple Computer Inc., "Ten or twenty years from now, you'll see an explosion of entrepreneurial industries and companies that will essentially form the real virtual corporations. Tens of thousands of virtual organizations may come out of this." The risks include companies' dropping the ball, leaving their virtual partners in the lurch, risking proprietary technology and information, and losing management control critical to corporate success.

Global competition and fast-paced technology require more innovation, speed, and knowledge than companies can manage alone. In order for the virtual corporations to be

Continues on p 5

viable, Byrne says, "changes in antitrust policy and intellectual-property laws may be necessary to spur cooperation among companies." Additionally, a computing superhighway, a national infrastructure linking computers and machine tools across the nation, must be in place before optimal communication, which is essential to virtual corporations, can be achieved. [Byrne, J. A. (1993, February 8). The virtual corporation. *Business Week*, pp. 98-103. Submitted by Linda Blanton, Fayetteville (NC) Technical Community College]

> In general, the more effectively we create the virtual university, the more prepared our students will be for the virtual corporation.

Distance Education

Audio teleconferencing, interactive or two-way video, and other electronic delivery systems are being used more and more frequently to reach distance learners. The three components to be considered in selecting delivery systems are programming, faculty competence in dealing with non-traditional education, and evaluation of the success of student learning. The University of Wyoming has utilized distance learning for several years and contends that the success of the program depends on faculty development, class-by-class feedback forms, midterm feedback session, and end-of-term evaluations by both faculty and students.

With respect to faculty development, teaching via technology is different from face-to-face teaching. Much additional effort must go into recruitment of and pre-course discussions with faculty, workshops and seminars that teach instructional design and facilitation of distance learning programs, and on-going coaching sessions for instructors.

Systematic formative evaluation feedback must be gathered to monitor the distance learning progress of students early in the course and throughout the course in order to make necessary adjustments. Small groups at distance learning sites provide assessments at the beginning of each session, with a more extensive midterm session, to keep learning on track.

Summative end-of-term evaluations by faculty and students are used to help them become more comfortable with the technology and improve the course in the future. [Shaeffer, J. M. & Farr, C. W. (1993, April). Evaluation: A key piece in the distance education puzzle. *Technological Horizons in Education*, 20 (9), pp. 79-82. Submitted by Sylvia Pierce, Fayetteville (NC) Technical Community College]

Implications

Two trends, the virtual corporation and distance learning, are inevitably going to converge in a number of possible combinations. One of the most obvious is *the virtual university*. If the campus is an electronic metaphor rather than a physical place, then its various classrooms and learning resource facilities need not be those of a single institution. In many respects, when students sit in a library on campus or at home and search the catalogs of the National Library of Medicine, Ben Gurion University and a commercially provided news service, they have already entered a virtual library. When they download, over the Internet, self-study software developed by faculty at another university, they are even closer to the virtual university. The challenge for universities, as it is for any other institution, will be whether they can approach virtuality with the required skills and commitments. Among these are:

- **Task specific communication and coordination:** This is the ability collectively and rapidly to establish a vision of the task at hand, to understand the abilities and limitations of all participating individuals and institutions, and to establish responsibilities in such a way that each set of strengths is used best.
- **Trust and autonomy:** Bureaucracy and the unwillingness to delegate authority will sink any virtual arrangement, because decision times will increase exponentially with respect to the number of participating institutions.
- **Customer centeredness:** Once the virtual institution is a commonplace for the user, competitiveness will dictate that all participants make the user's satisfaction uppermost. The student or customer will no longer be a captive audience/market.
- **Rapid, credible evaluation**: This is as important to the virtual corporation as it is to the distance learning program. For both,

Continues on p 6

it is the measure of quality and of customer satisfaction, and it is the most effective basis for continued cooperation and coordination.

In general, the more effectively we create the virtual university, the more prepared our students will be for the virtual corporation.

We should, however, recognize several questions. If campuses become electronic metaphors housed in multiple institutions, who sets the standards? Who grants the degree? What kind of degree?

Other implications: in the virtual university students can tap into the ongoing discussion of senior researchers and scholars, and may contribute to these discussions. Will this clarify or further cloud the research versus teaching controversy? Too, in virtual universities boundaries are even more permeable; small research teams unconnected (or barely connected via adjunct appointments) and therefore unencumbered by bureaucratic regulations, may function more innovatively and efficiently than senior research staffs within the university. How will established institutions respond to, take advantage of, or react against, these trends?

> . . . the general public and our policymakers seem comatose when it comes to understanding our physical infrastructure. It is a challenge to higher education to develop improved approaches to educating our upcoming leaders about the society's infrastructure in order that future decisions and policy can be made from a background of true knowledge and understanding rather than the false perceptions and myths underlying today's decisions and policy.
> — Albers

TECHNOLOGY

Federal Science and Technology Policy in Transition

The need to examine and restructure federal policy related to science and technology has become a high priority issue with the Clinton administration. This new sense of urgency in Washington has its roots in two major areas of change that are taking place: first, the U.S. must adjust to the rapidly emerging global economy in which compe-tition depends strongly on technological competency; and second, the end of the cold war and the demise of the Soviet Union have precipitated the conversion of R&D funding from defense-related goals to peacetime-related goals. Joseph Coates, one of America's leading technological forecasters, states that "the time has never been better or more appropriate for business and industry to create an unequivocal constituent base for radical changes in federal policy toward science and technology."

Coates goes on to outline a strawman agenda of short-term actions and specific initiatives that would, in his opinion, facilitate some of the radical change required. Among these are proposals for (a) scientific and technological training for government decision-makers, (b) the quick appointment of a Presidential science advisor, (c) the formation of a science advisory committee, (d) the formation of a National Foundation for Technology parallel to the National Science Foundation, and (e) an immediate restructuring of key federal science agencies. Whether they agree with him or not, Coates urges the business community to

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promote their own proposals to ". . . relentlessly push the new Administration to bring about the necessary technology changes for the health of the nation." [Coates, J. S. (1993, January/ February). Science and technology issues/ opportunities for the new U.S. administration. *Research Technology Management*, pp. 7-9.]

Implications

Although the message above was directed to business and industrial leaders, it is clearly an appropriate message for leaders in higher education as well. Contemporary U.S. society looks to its institutions of higher learning not only to provide educational competence in scientific and technological training of its citizenry, but also to perform creative and innovative fundamental research that feeds the scientific and technological food chains. Much of the research done at institutions of higher learning is strongly dependent on funding from government and industry. Thus leaders in higher education have a great stake in what shape national policy takes, relative to science and technology. It appears that higher education has had little to contribute to the current debates on this subject. This must change; the community of educational leaders must have their voices heard in the formation of national policy regarding science and technology or else the role that higher education will play in the emerging scheme of things could be much less than desirable.

> How long can universities afford not to downsize? Most university administrators will contend that they have already done it. They will say, 'Look at our faculty numbers. We have not hired anybody new for the last three years. We aren't even replacing our retiring faculty. We are teaching the same number of students with some 20% fewer faculty. — Kefalas

What's All This About Infrastructure?

President Clinton's economic stimulus package included substantial expenditures for restoring the U.S. infrastructure and simultaneously creating new jobs. This is fine; the objectives are noble. But some serious questions have been raised about whether or not the infrastructure really does need restoration, or at least to what degree restoration is required. The fact is that just a few short years ago, for citizens and policymakers alike, the concept of infrastructure was vague and uninteresting. And here we are today promoting expenditures in the neighborhood of $20 billion a year to heal our ailing highways, sewers, energy distribution systems, airports, and railways. When expenditures as large as these are contemplated, some individuals are stimulated to carry out pretty serious analyses in order to test the justification for such expenditures. Heywood Sanders presents persuasive arguments that what are perceived as infrastructure problems are myth. The key point raised by Sanders, however, is how little we know about our infrastructure, both from the economic and from the technological perspectives. [Sanders, Heywood T. (1993,Winter/Spring). What infrastructure crisis? *The Pubic Interest*, pp. 3-18.]

Implications

It appears that one area of science and technology that has been neglected by higher education in recent times is how strongly dependent a nation's well-being is on the reliability and stability of its infrastructure. The condition of highways, the safety of airports, the quality of drinking water, and the environmentally-sound disposal of waste depend significantly on the science and technology that are brought to bear on these issues. And yet the general public and policymakers seem comatose when it comes to understanding physical infrastructure. It is a challenge to higher education to develop improved approaches to educating upcoming leaders about society's infrastructure in order that future decisions and policy can be made from a background of true knowledge and understanding rather than the false perceptions and myths underlying today's decisions and policy. [Editor's note: the Technology section was written by Walter A. Albers, Jr., Albers Systems Inc.]

ECONOMICS

Economic Trends and Their Impact on Higher Education

The decade of the 1980s found the entire world in a period of slow-to-negative growth. After several decades of substantial growth rates, most developed countries began to experience either no-growth or at best, slow-growth of their economic activity. For all practical purposes, Organization for Economic Development and Cooperation (OECD) member states, the wealthiest 23 countries of the world, crawled at a meager annual growth rate of 2%.

The United States as the largest economic unit of the world, with a GDP of $5.6 trillion, enjoys the lion's share of the world's $16 trillion economic product. The world's richest country is also the world's largest consumer market. Americans use and consume great quantities of products made in other counties. By the same token, every year the rest of the world uses and consumes great quantities of products made in the U.S.A. Every year the U.S. government collects large quantities of money from its citizens and corporations while laying out large sums of money to its citizens in the form of wages, salaries, and transfer payments such as pensions and other forms of assistance.

The 1980s witnessed a phenomenon called the Double D phenomenon. In 1984 the U.S. turned from the world's biggest creditor to the world's biggest debtor. The country's insatiable appetite for consumption had to be satisfied by importing more and more foreign goods and capital. The end result of this increase in imports was a continually growing merchandise trade deficit that reached $170 billion a year. At the same time at home, government's ever growing outlays could not be matched by government's revenues. The end result was a huge national debt that approached the $1 trillion mark at the beginning of the Reagan administration and may exceed $7.2 trillion by the end of the Clinton administration. By 1996 every American adult and child will be in debt for some $28,000. Between the merchandise deficit (D1), and the national deficit, (D2), the U.S. is having to hustle for more foreign money to balance its international accounts, and to borrow more cash to keep its paychecks from bouncing.

> Five year strategic plans that are devoid of attempts to foresee and understand the changes in the social, technological, ecological, political and economic environment are wasteful expenditures of finances, and of faculty and administrators' time and precious resources.
>
> — Kefalas

The implications of this Double D phenomenon for the society at large and for its private and public institutions are enormous. Whereas private enterprises tend to respond quickly to, and even occasionally act in anticipation of, the changes in the economic activity, public institutions lag behind and most of the time resist any adaptation to the changing environment. Whereas business enterprises were downsizing in response to slowed growth and even shrinkage in the economy, institutions of higher education refused to consider it as a permanent phenomenon.

Industry's responses to high-growth conditions in the post WWII era began by adding large numbers to the hourly labor force. Large numbers of hourly workers required large numbers of supervisors (i.e., people who tell workers what to do). Large numbers of supervisors required equally large numbers of lower level managers and so on all the way to the top of the hierarchy. Thus, the 50's and 60's saw a phenomenal increase in the volume of the organizational hierarchy. The top was populated with herds of VPs who served the CEO. The middle of the hierarchy was bulging with thousands of middle managers aimed at pleasing the VPs, and so on all the way down to the bottom of the hierarchy. Private enterprises became large, fat, inflexible dinosaurs that dominated society.

The 1980s ushered in the era of downsizing. This buzzword was invented by the media to describe the reversal of the process of growth and expansion that took place during two previous decades. The first response to slow growth was automation aimed at replacing

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hourly workers with machines. Automation left supervisory and management personnel virtually intact, but without large workforces to oversee. As growth prospects remained slim and profit margins began to disappear, industry critics turned their searchlights on management. Suddenly everybody noticed the unnecessary huge numbers of managers and VPs. As the number of middle managers dwindled, VPs became obsolete. Firms began to close down one plant after another, causing whole divisions to disappear, taking corporate VPs and hundreds of division heads with them. Slim, trim, lean and mean became the attributes of *excellent corporations*.

What about institutions of higher education? In this environment, are these institutions immune to the epidemic of lean, mean, flexible organizations? How long can universities afford not to downsize? Most university administrators will contend that they have already done it. They will say, "Look at our faculty numbers. We have not hired anybody new for the last three years. We aren't even replacing our retiring faculty. We are teaching the same number of students with some 20% fewer faculty."

Faculty members are to universities what lower management staff are to industry. Institutions of higher education may have trimmed their untenured rank-and-file faculty and some of their support staff, but administrative staff have been left untouched, and in some cases, have even increased. What's happening?

Faculty members are to universities what lower management staff are to industry. Institutions of higher education may have trimmed their untenured rank-and-file faculty and some of their support staff, but administrative staff have been left untouched, and in some cases, have even increased. What's happening?

— Kefalas

One could perhaps think of at least three scenarios. One scenario might be named the "False Alarm: Everything is O.K." scenario. A second might be the "Temporary Inconvenience: Budgetary Belt-Tightening" scenario. A third scenario might be a "It's for Real: A Demographic Tale" scenario.

The first two scenarios are, of course, fairy tales. There is no false alarm; the so-called temporary inconvenience is a permanent phenomenon, which even though long in the making, was not foreseen by university administrators or legislators. The former promised to do a better job in the future; the latter promised to push for more support. The time has come for universities to start learning while they are teaching. Universities must themselves become learning organizations. In other words, universities must learn to learn what their external environments are and how they should adapt to their environments' changing conditions. Five year strategic plans that are devoid of attempts to foresee and understand the changes in the social, technological, ecological, political and economic environment are wasteful expenditures of finances, and of faculty and administrators' time and precious resources.

A Demographic Tale

The story of universities asleep at the switch serves well to illustrate our point. Universities are systems that process human minds. The more humans there are, the greater the need for mind-processing systems. The fewer minds there are, the less the need for mind-processing machines, called the education system. A quick look back since the end of the WWII will reveal that the growth of the number of humans, called population, mirrored the growth of the economy. Children who were born became potential reproduction systems. It seems a given that the more reproduction systems there were, the more humans would be born. Thus a peculiar phenomenon began to appear that might be called the "double exponential self-feeding-growth" machine. More people produced more goods, which allowed more people to be produced, thus creating a virtual circle, but soon to be turned into a vicious cycle.

For the decade of the 1970s also was the decade that ushered in the age of the pill. Birth rates dropped below 2% in most industrialized countries, bringing the number of children per family dangerously close to two, enough to

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satisfy the zero-growth or steady state condition. In some countries, humans postponed their reproduction until later ages, or even avoided it all together. Countries like West Germany grew negatively due to a very low birth rate, while other countries like the U.S. managed to maintain a slight increase in their populations due to net immigration. However, institutions of higher education in United States were noticeably slow to recognize these changes in the demographic scenery of the country. Although every year the Department of Labor was revising its estimates downward for population increases, universities used their resources to advise industry and government how to respond to upward estimates, adding staff and faculty positions and continuing to build larger and larger classrooms in anticipation of the huge numbers of minds-to-be-processed.

Changes in an organization's external environment call for changes in the organization's strategy and structure. These changes aim at aligning the organization's vision, mission, strategies and operational plans so that environmental constraints will be observed, threats will be avoided and opportunities will be capitalized on. Here are six strategies to use to adapt to the environment. We list them here, but intend to treat them in detail in subsequent issues:

1. Think strategically, globally and futuristically.
2. Restructure: create a flat and lean structure.
3. Empower faculty.
4. Use existing human assets to their maximum.
5. Embrace information technology.
6. Form strategic alliances; cooperate to compete.

[The *Economics* section was written by A.G. Stell Kefalas, Professor of Management, University of Georgia]

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- Kefalas

ENVIRONMENT

Global Diplomacy

Throughout most of the 20th century, diplomats have concentrated on questions of political and economic relations among nation-states. As the century closes, a third set of international problems, those relating to the health of the planet, is coming to the fore. The threatened depletion of Earth's ozone layer is a prime example of such challenges (other items on the new agenda include global warming, deforestation, species extinction, desertification and soil erosion, and pollution of common resources). Ambassador Benedick, the chief US negotiator of the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer, later revised in 1990, describes the negotiations and the protocol as "the forerunner of an evolving global diplomacy, through which nations accept common responsibility for stewardship of the planet." Some lessons for this new diplomacy are:

1. Scientists must play an unaccustomed but major role in international environmental negotiations.
2. Governments may have to act while there is still scientific uncertainty, balancing the risks and costs of acting or not acting.
3. Educating and mobilizing public opinion are essential to generate pressure on hesitant governments and private companies.
4. Strong leadership by a major country can be a significant force for developing consensus.
5. It may be desirable for a leading country or group of countries to take preemptive protection measures in advance of a global agreement.
6. Economic and structural inequalities among countries must be adequately reflected in any international regulatory regime. In the long run, the huge and growing

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populations of Less Developed Countries (LDCs) could undermine efforts to protect the global environment.

7. The effectiveness of an agreement is enhanced when it employs market incentives to stimulate technological innovation.

[Benedick, R.E. (1991). *Ozone diplomacy: New directions in safeguarding the planet.* Cambridge, MA: Harvard U Press. Adapted from *Future Survey Annual, 1992*]

More than 2.2 million tons of toxic garbage cross borders each year, with no end in sight. Like drugs and arms, trafficking in hazardous waste has become big business for a new breed of "waste lords." Blocked by increasing regulation and local opposition to disposal sites, the stream of waste constantly searches for new outlets, usually poor communities and countries. Within the US, waste migrates to the rural South; in the UK, from England to Wales. The US is by far the greatest producer, generating 10 times as much hazardous waste as all of Western Europe, more than one ton of waste a year for each American. The US shipped 100,00 tons of hazardous waste abroad in 1987, with the figure rising by 40% by 1989. Recent reports suggest the problem is out of control, and that the EPA does not know how much waste is exported.

There is virtually no international mechanism to monitor the waste trade, much less police it for violations. The Basel Convention of 1989, a treaty on the export of toxic waste, called for exporters to notify and receive permission from importers before any shipment may proceed. But LDCs have no mechanism to enforce provisions, and remain at the mercy of the First World. [Center for Investigative Reporting & Moyers, B. (1990). *Global dumping ground: The international traffic in hazardous waste.* Washington: Seven Locks Press. Adapted from *Future Survey Annual, 1992.*]

The Contagious Hospital

Medical waste has increased greatly in the past 10 years, partly because hospitals use more disposable items, such as syringes, cutlery, food trays, bedpans, and even linen. The public especially fears medical waste, such as syringes washing up on beaches, but the likeliness of acquiring AIDS or hepatitis in this way is very small. The real danger, which has received far less notice, stems from the 6,000 substandard medical-waste incinerators at US hospitals. Usually concentrated in populous urban areas, they spew tons of toxic emissions, including dioxin, heavy metals, and acid gases, into the air, averaging 10 to 100 times more per gram waste burned than emissions from well-controlled municipal waste incinerators. Hospital incinerators also leave large quantities of toxic ash that can contaminate surface water and ground water when dumped in landfills.

Switzerland and Germany offer a better model for handling medical waste, sending it to regional incineration facilities with advanced air-pollution control technologies. Both countries require complete manifests of transported wastes to insure that all medical refuse goes through the system. Small generators of medical waste such as labs, nursing and funeral homes, and medical and veterinary clinics, could also send their refuse to regional treatment sites. [Hershkowitz, A. (1990) Without a trace: Handling medical waste safely. *Technology Review*, 93(6), 35-44. Adapted from *Future Survey Annual, 1992.*]

Implications

Environmental issues are complex problems that span international boundaries. The solution to these problems will only come from interdisciplinary collaboration and international discussion. Universities must continue to work toward trans-disciplinary collaboration, and not all are taking the lead in their communities. Politicians must learn to keep science separate from pork barreling, and must rely on experts for informed decisions on funding and sponsorship of policies.

POLITICAL

Congressional Oversight

Congress has long voted money for influential legislators' pork barrel projects such as roads, dams, and post offices. Then, almost without public notice, Congress extended pork barrel politics to a new domain: science. The result of pork barrel funding of science has been chaotic and subject to political influence. Funds go to everything from support of scientists, to support of congressional whims, with little sense of priorities. Congressional micro-management, not scientifically informed,

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science over little science.

Rather than assigning science allocation to Congress, Joseph Martino, an expert on technology forecasting, agrees with Francis Crick, co-discoverer of DNA, that it is "far better for research pro-grams to have many sources of money, with a series of mini-dictators to distribute it." Martino recommends additional programs such as greater research support from industry, a stronger patent system, increased US savings rate, improved financial accounting standards, more research support from private foundations, income tax deductions for private funding of research (parallel to deductions for charitable organizations) and the elimination of government actions that discourage support for research (e.g., the proposal to tax advertising revenue for scholarly journals). [Martino, J.P. (1992) *Science funding: Politics and pork barrel.* New Brunswick NJ: Transaction Publishers. Adapted from *Future Survey,* (1993, April).]

Congressional micromanagement, not scientifically informed, freezes out innovative ideas, and favors big science over little science.

In late 1991, there were about 1,000 advisory committees of all kinds in the U.S. Federal government, reporting to 57 sponsoring agencies. About half of them are clearly scientific; others could be considered scientific under a looser definition. Their activities include peer review, program advising, ad hoc fact-finding or investigating, and providing advice on broad political-technical issues.

According to Bruce L. R. Smith of the Brookings Institution, successful advisory committees have a clear mandate relating to an issue or problem, an identifiable client or point of access to the agency, a committee chair "on the same political wave-length" as the policymaker, some diversity of outlook, adequate sup-porting resources, and a pragmatic rationalist mode ("They will almost always have subtly negotiated the terms of what they will say so as to mesh with the goals of their clients").

Science advisory committees have sometimes played significant policy roles vis-á-vis input for governmental agencies, but they also are vulnerable to neglect, misuse, or atrophy. Committees face an increasingly burdensome climate, as the need for technically informed and experienced advisors seems more important than ever. The challenge is to make the advisory system con-tribute to effective government without creating more bureaucratic clutter that prolongs and complicates decisions. Fair balance is needed in the advisory system to find an effective level of creative tension that will nurture debate while avoiding an entrenched old-boy network and the dangers of arrogance and irrelevance. [Smith, B. L.R. (1992). *The advisors: Scientists in the policy process.* Washington: The Brookings Institution. Adapted from *Future Survey,* (1993, April).]

Implications

Old-boy networks and pork barrel funding of science stifle innovation and ultimately lead to the corruption of the scientific enterprise. Science flourishes in an environment of open debate and peer review. It is incumbent upon all institutions of higher learning to maintain a climate of open debate and creative tension and to remain at arms length from the political process. Unfortunately, the recent controversies at Stanford University regarding the inappropriate use of indirect costs, and at the University of California regarding the multimillion dollar retirement package of their president give the impression that scientific research is just another government supported commodity.

The Situation Room

Richard Heydinger
The University of Minnesota

Environmental scanning is frequently described as an organizational radar screen, sweeping all 360 degrees of the horizon to identify trends and events that have longer term implications for the organization. Thus the name, *On the Horizon*, is an apt moniker for this newsletter. Yet a highly sophisticated radar system can differentiate the friends from the foes, the "meteorites from the missiles." *On the Horizon* also provides this differentiation by discussing the implications of each trend and event in the context of higher education. In

this column, we will take this process a next step. We will add the process of issues management to environmental scanning.

Issues management is akin to sending out a scouting party to more closely examine the issue that scanning has identified. Issues management develops a thorough definition of the issue we are tracking. In issues management we explore ways to shape the issue, to build on it, or to deflect it. We also begin to develop organizational strategies and responses, so that we are prepared to respond as the issue unfolds. We have dubbed this column *The Situation Room* because it is here that we will examine alternatives for affecting the development of the issue. We will also explore alternative courses of action for colleges and universities. In other words, we will discuss ways to manage the issue.

Issues management was coined in 1984 by W. Howard Chase in his book *Issues Management: Origins of the Future*. As a public policy advocate, Chase proposed a methodology for becoming an actor, not a bystander, in the development of public policies that affect the organization. Like environmental scanning, issues management is much more art than science. Effective leaders have done it for centuries. However, given the pace and interconnectedness of today's world, organizations can benefit from a more systematic approach.

This was demonstrated to me personally in 1986 when the University of Minnesota experienced its first animal rights demonstration. As our administrative team huddled to devise a response, it was obvious that we were reacting to this incident differently than we had to previous protests. In fact, we were prepared.

We already had a comprehensive policy to assure the responsible use of animals. We already had a compendium of facts ready for the protesters and the media. We already knew who would be our chief spokesperson. As a result, we handled the protest in a more self-confident, more sensitive manner, putting forward our side of the story forcefully. As we negotiated with protesters, we were clear on our own bottom-line and a potentially ugly situation was defused. Nightly news accounts presented a balanced perspective on the use of animals in research, not just the arguments of the animal rights activists.

In 1986 when the University of Minnesota experienced its first animal rights demonstration . . . our administrative team huddled to devise a response. It was obvious that we were reacting to this incident differently than we had to previous protests. In fact, we were prepared.
- Heydinger

As I reflected upon our success, I realized that this did not happen by chance. Two years before, Minnesota's environmental scanning team had identified animal rights as an issue that needed more attention by our institution. As the scanning team surveyed various publications and interviewed institutional leaders, it became obvious that animal rights was an issue that was gathering momentum across the country. As an institution that purchased over 1 million animals per year for use in research, the University of Minnesota could easily become a prime target for protests.

Thus, we commissioned an animal rights issues management team. This group developed a work plan for assembling data, developed and got approval for appropriate policies, and reviewed actual institutional performance. When the protest arrived, the institution was not only prepared but was able to counter the protesters' claims by citing the institution's on-going efforts. Although in the past eight years there have been additional demonstrations and protest activity, all of this has been handled in a self-confident institutional manner. Our effective response originated with our early

Dayton-Hudson, a large retail chain with an active issues management program, classifies the issues they are tracking by using a retail product typology. Issues are placed in one of five categories: testing, incoming, pre-peak, post-peak, outgoing.
- Heydinger

environmental scanning and the subsequent issues management response.

As this example demonstrates, issues management is a natural follow-up to scanning. Issues go through cycles. Dayton-Hudson, a large retail chain with an active issues management program, classifies the issues they are tracking by using a retail product typology. Issues are placed in one of five categories: testing, incoming, pre-peak, post-peak, outgoing. In this column we will strive to identify issues that are in the testing or incoming phase, so that you can utilize this discussion in your own work.

Of course, outgoing issues at one institution can be incoming at another. Our work is motivated by our colleague Ian Wilson's poignant remark: "The societal concerns of yesterday become the political issues of today, the legislated requirements of tomorrow, and the litigated penalties of the day after."

Each month in this column we will strive to add further depth to the definition of a particular issue. We will discuss alternative modes for studying an issue; in some cases we will explore alternative courses of action for managing the issue. Our perspective will be one of institutional action, not just identification.

"Our work is motivated by our colleague Ian Wilson's poignant remark: 'The societal concerns of yesterday become the political issues of today, the legislated requirements of tomorrow, and the litigated penalties of the day after.'"
—Heydinger

In next month's *Situation Room* we will focus on the world of instantaneous communications in which we all live, and the growing influence the media is playing in managing today's colleges and universities. Many higher education administrators yearn for the days of yesteryear when their institutions received more favorable and less adversarial coverage by the media. However, with the growing popularity of the docu-drama and the live mini-cam, those days are gone. Managing today's higher education institution requires effective media strategies that build on up-to-date assumptions about this industry's operation and its markets.

In the future, guest columnists will provide some of the analysis. If you have spotted an issue on your scanning screen that you would like to discuss, please contact me directly. Guest editorials are always welcome. Rick Heydinger, Alliance for Higher Education, 203 Burton Hall, University of Minnesota Minneapolis, MN 55455 (Phone: 612-624-8586; Fax: 612-626-7496: INTERNET: heydinge@mailbox.mail.umn.edu).

TOOLS

ClarisWorks for Windows; ClarisWorks 2.0 (Macintosh)

You're just not a major league software publisher if you haven't brought out SomethingWorks. *Works* is considered to be a codeword for integrated, which is itself a codeword for trying to be all things to all people, or at least most things to most people.

It does make sense. After all, the final product for most of us who use the computer is some kind of document. No document is worth the name if it doesn't include a few paragraphs or pages or chapters of text. If we use quantitative information, chances are good our document will also have tables of numbers linked by formulas, so that if we change one number the related numbers can change accordingly. These numbers were doubtless stored in a database somewhere, accumulated, sorted and reported before finding their way into a spreadsheet for analysis. By keeping the results in a spreadsheet, we can deal with the inevitable last-minute changes from staff and associates. And let's not forget charts. It's not so long ago that each of these—text, databases spread-sheets and graphing—had to be taken care of by different programs. Even with some pretty fancy hardware, we were physically cutting and pasting our documents together. And we had to run first one program, then another, to get our work done.

A few years ago, Microsoft put an end to all that and brought out Microsoft Works, first for

the Macintosh and later for the PC. Earlier, Lotus had tried to introduce something called Jazz, which, if it had actually worked, might have made a serious difference in the balance of power on the Mac. Earlier still, in fact about an hour and a half after the introduction of the Macintosh, a couple of German physics students created RagTime, the best-selling office software in several European countries, a dismal marketing failure in the US, but arguably the best general software product in the history of personal computing. Claris admits that RagTime is its most formidable competition outside the US, and heaves a sigh of relief that it was never well marketed here. I won't review it in this column until they bring out a PC compatible version.

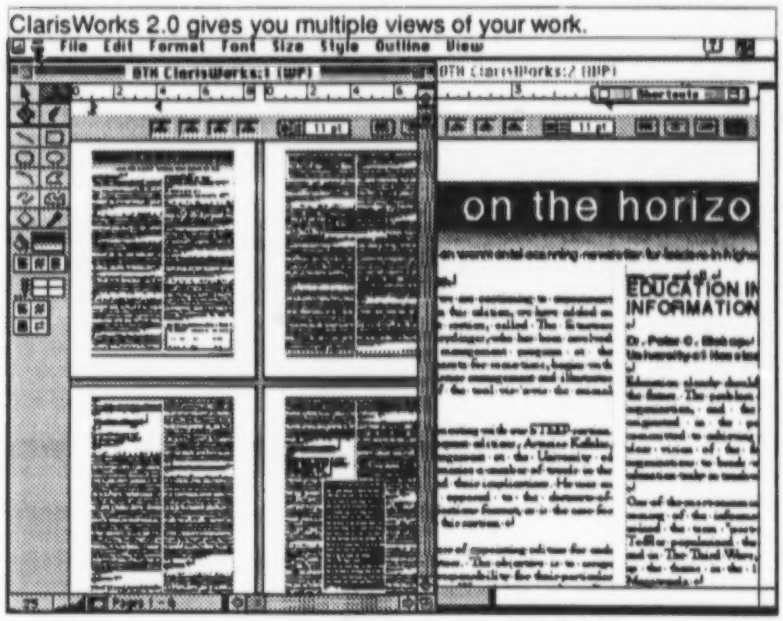
A bunch of little programs, glued together by the weakest of bonds, Microsoft Works was more like an assortments of one-ounce boxes of breakfast cereal than anything else. But at least you could keep a spreadsheet and a word processor open at the same time, long before there was Windows or MultiFinder.

ClarisWorks 2.0 is wonderful; it will knock the socks off of Microsoft Works users who are allowed to try it out.

In what may have been one of the funniest marketing decisions since New Coke, Claris recently started shipping ClarisWorks 2.0 for the Macintosh, and has announced ClarisWorks for Windows. ClarisWorks 2.0 is wonderful; it will knock the socks off of Microsoft Works users who are allowed to try it out. It should get great reviews. So, in a month or so there is going to be this big splash as Claris announces that ClarisWorks now runs on both machines. The punch line—the version that is coming out for the PC is identical to the ClarisWorks 1.0 that has been running on the Mac for the last couple of years, but not to the latest version of ClarisWorks. Seems the development team under-estimated the time necessary to make something work as well on a PC as it does on a Mac. I have found no evidence of issues management at Claris regarding this forthcoming embarrassment.

Now for the similarities and differences. In the illustration, you can see just how integrated the program is. The tools palette on the left of the screen contains drawing and painting tools, as well as the four tools at the top, which permit you to choose what kind of *frames* you are going to put on the page. All of these tools and frames are constantly available, whether it is a spreadsheet that you would like to drop in the middle of a page of text, or a masthead you'd like to create with the draw and paint tools and put at the top.

ClarisWorks 2.0 gives you multiple views of your work.



This edition of On the Horizon was produced entirely in ClarisWorks 2.0, rather than in the usual combination of drawing programs and PageMaker. The fancy gradation screen used for the masthead is a new feature, not available in the Windows version yet, although the Windows version could easily import it from another program. The multiple views of the document, so handy when you need to work up close but see the implications for the overall page, are unique to version 2.0, so they won't be on the IBM-compatible side for a while. But the ability to embed multiple frames in text is in all versions, as is the ability to

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blow the view up or reduce it.

(Claris, if you are listening, PLEASE distribute a translator to convert 2.0 files to the Windows version. Make it transparent to users on both sides. You'll reduce the disgruntlement. Call it Claris Classic. Get the Windows version up to speed with the Mac 2.0 version. Then you can rest.)

Here's what you get, all in one package that fits easily on a small drive with modest RAM (read "laptop"): a word processor with thesaurus and spelling checker, along with a built-in outliner; a database with great layout capabilities and all the built-in functions most of us will ever need, including the ability to merge and purge mailing lists and print labels; a spreadsheet capability that can put multiple spreadsheets in the middle of a page of text, or a drawing, a remarkable draw and paint capability that is always available; some great file translators that let you accept and produce files from/for most popular programs on the IBM-compatible or the Mac; and a telecommunications module that on both machines, but especially under Windows, is quite distinct from the other capabilities, although you can keep other documents open while you are telecommunicating, so that you can drop what you download into the document you are working on. Telecommunications has a Kermit ability. If there are no idiosyncrasies to your mainframe, you can do file transfer. (I can get files from Duke's computer just fine, but not from UNC's. So don't throw away your other Kermit programs.)

The biggest disadvantage to this software is the absence of hyphenation, which means that narrow, justified columns are going to look awkward on some lines unless you are willing to insert hyphens. That's why the screen shot isn't in the center of the previous page. Still, if it's integrated software you want, ClarisWorks for Windows and ClarisWorks 2.0 for the Macintosh are the right choice. Just make sure you watch for the upgrade to the Windows version as soon as it comes out.

BTW (bulletin-board-speak for *by the way*.)

On-line bibliographic databases, such as those made available over Dialog, can speed parts of the research process dramatically. But we may have come to rely on them more than we should.

I had occasion to assist a friend in putting together a package of information in support of her consideration for promotion to full professor. One part of the package was a search of the Science Citation Index (SCI) and the Social Sciences Citation Index (SSCI).

In helping with the search, I learned that there are not only no universally accepted standards for what is appropriate to such a list, but that from department to department, and even between candidates, no set of rules was followed at the university in question.

For example, it's fairly easy to fatten the list by including every occurrence of a self-citation. (Have you ever seen a publication in which the author didn't cite him- or herself at least once?) There were no rules about whether self-citations counted equally with citations by others. Moreover, SCI and SSCI will only lead you to instances in which the first author was cited. Thus, if the candidate is second author, a much more detailed search is necessary.

Several librarians at a number of universities have told me that there are no guidelines regarding such searches. The consequences can be profound. Using a CV with 100 publications, one librarian, using "the same method I use for all my tenure and promotion candidates." found 190 citations. A second librarian, who routinely takes into account more than just first authorship, found a total, without self-citations, of more than 400. The cost for the two searches was more than $700.

If such searches are important to promotion and tenure, there should be rules for them. An institution might save considerable money by investing in the CD-ROM version of the databases. If individuals are being asked to pay for the searches, the rich will get richer and the poor will get poorer. And the less-savvy, less-well-mentored, less culturally mainstream members of the faculty, will be at a real disadvantage in the quest for a promotion.

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On the Horizon

June 1993 Vol. 1 NO.5

IT'S TIME TO RE-INVENT HIGHER EDUCATION

A Strategic Assessment

David Pearce Snyder, The Snyder Family Enterprise, and Gregg Edwards, the Academy for Advanced & Strategic Studies

In its 1982 Annual Report to the Joint Economic Committee of Congress, the U.S. Bureau of Labor Statistics (BLS) forecast that by the end of the decade there would be far more college graduates than there would be appropriate jobs for them. At the time, no one paid much attention to the BLS projections, since conventional wisdom held that the United States was on the way to becoming a high-tech information economy in which a college degree would be the minimum requirement for all middle class jobs.

At regular intervals throughout the 80s, surveys of employers reiterated mounting concerns over putative shortages of college-trained workers, especially scientists and engineers. These forecasts, plus Americans' long-standing faith in the unalloyed value of education, sustained an ongoing boom in college enrollments during the 1980s, in spite of the fact that the traditional college-aged share of the U.S. population shrank by 15% and average tuition doubled.

We are about to re-invent all of our great institutions. When we get done, we will have re-invented America.

To offset the rising costs of higher education, the government, business and philanthropic sectors nearly doubled college financial aid, including over $15 billion in student loans. Politicians, economists and school officials routinely cited the widening gap between the median incomes of college graduates and their high school counterparts. But, as the 80s turned into the 90s, economic reality and the 1982 BLS forecasts converged, and higher education began to look more and more like a very expensive highway to nowhere.

A July 1992 U.S. Labor Department analysis revealed that the growing income disparity between high school and college graduates had been almost entirely due to a sharp drop in the wages of high school graduates. The average income of employees with college degrees barely kept pace with inflation in the 1980s, indicating that there was no marketplace shortage of such workers. The BLS estimated that at least 35% of recent college graduates, including scientists and engineers, end up in jobs that do not require a post-secondary degree. A 1990 survey of 55,000 1980-88 college graduates revealed that only 1/3 or fewer of those with degrees in the social sciences, humanities and liberal arts were able to find employment in their own fields, just as BLS had predicted back in 1982.

Higher education wasn't the only major U.S. institution to misjudge the on-coming curve of national restructuring during the past decade. Even though America's employers bought $1.2 trillion worth of new information technology during the 1980s, productivity growth among information workers did not improve. Hundreds of billions were spent on center city development, but most urban economies continued to deteriorate. Similarly, Americans invested over $1 trillion in higher education—double what we spent in the 1970s; yet neither the graduates nor the nation as a whole appeared to have derived any significant additional benefit. One published estimate by a member of the National Academy of Engineering asserted that only 1/6 of the 2.7 million scientists and engineers who graduated between 1978 and 1988 were actually working in the fields for which they had prepared.

The Future Is Closer Now

By the end of the 1980s, it was clear that the information economy would not require millions of additional scientists, mathematicians and engineers. It *will* require workers, at all levels and in all functions, who possess formal information-using skills; these include the ability to gather, organize and analyze data, and the ability to think systemically. To achieve most of the productive potential of information technology, employers will have to do more than simply install computers and train people. Institutions will also have to completely re-

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design their management systems and their organizational structures to permit their employees to apply their new tools and skills to the direct improvement of their work activities.

The installation of electronic info-com technology does not represent the ultimate refinement of the Industrial Age: it is merely the basis of a new source of added economic value. Whereas historically, such technological transformations take a generation or more to complete, today the pace has accelerated; we are nearing the half-way point in our transition from labor-intensive production to information-intensive production, and a general transformation of our basic economic institutions is already under way.

After 15 years of experimentation, both corporate America and organized labor have all but announced that team-work is not just the current management fad, it is the new management. E. Edwards Deming will be the Frederick W. Taylor of the 21st Century, and Max Weber's 100 year-old multi-layer bureaucratic pyramid is now being de-constructed to make way for flat organizations made up entirely of teams—rank and file teams, middle-management teams and executive teams. During the 1980s, the average *Fortune 500* firm eliminated five layers of management, and in the process sharply reduced the marketplace demand for the literate, but otherwise un-skilled liberal arts and humanities graduate. Teamwork is rapidly sweeping through the public sector as well, at all levels of government. Even more remarkable, performance-based pay, an essential concomitant of successful teamwork, is also appearing in a growing number of institutions, replacing credential based merit pay for professional and technical personnel in both the private and public sectors. American organizations have begun to re-invent themselves.

Re-inventing Our Institutions

We are about to re-invent all of our great institutions. When we get done, we will have re-invented America.

One of the great American institutions we are about to re-invent is the public school. After a decade of largely ineffectual political initiatives, educational reformers have begun to focus upon experiential learning—including project work, internships, simulation, and performance testing—as the most purposeful innovation for improving school performance. During the 1992 presidential campaign, candidate Clinton issued a white paper endorsing U.S. adoption of a German-style of apprenticeship system in America. Since the election, Labor Secretary Robert Reich (long a proponent of experiential learning) has been working with a coalition of Democratic and Republican leaders in Congress to pass legislation to underwrite apprenticeship programs throughout the public schools of America.

Employers, from the U.S. Army to the Motorola Corporation, are also switching from classroom training to on-the-job, work-related training, from the remedial education level to the high-tech up-skilling. The adoption of experiential learning, like the adoption of teamwork, is not merely a current fashion. Experiential learning, for most people, is a demonstrably more effective means of imparting important skills and knowledge than is classroom instruction.

Information for Decisions

Citizens must be able to use information to make better decisions in the marketplace, in the voting booth and in their daily lives.

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The Hudson Institute's 1987 report, *Workforce 2000*, was the first of several studies to conclude that through the end of the labor intensive Industrial Era, the 1970s, only about 25% of all U.S. jobs required mastery of formal reasoning or information handling skills. The other 75% of the jobs required no more formal skill than the ability to read the safety warnings on the equipment. From now on, however, 75% of U.S. jobs will require formal information-handling skills, including graphic and statistical literacy, systemic thinking, and quantitative estimation and allocation. To impart these skills to so large a part of our population, our schools will have to teach all students in a manner that is most compatible to their learning style. We can no longer rely on classroom instruction as our principal means of education.

Most of the 3/4 of the U.S. work force of the year 2000 who are already out of school and in the labor pool, from the shop floor to the executive suites, will have to be upskilled during the 1990s, either to stay employed or get re-employed. Most adults don't learn any better from classroom lectures than their kids do, and thus, employee development is increasingly being incorporated on-the-job. A growing number of employers, from hospitals to machine shops, are collaborating with local community colleges to create associate-degree programs based upon combinations of cumulative work and classroom experience.

Four-year institutions are partnering with high-tech employers such as Motorola, IBM, and The Rand Corporation, to grant degrees based substantially on workplace experience. Simultaneously, thousands of post-secondary schools are granting credits in basic courses to individuals who are able to pass College Level Examination Program (CLEP) tests, or

Continues, p 4, col 1

From the Editor

This is our final issue in Volume One. Subscription responses have been great. We already have several hundred domestic and international subscribers.

For Volume Two, we are pleased to announce that the STEEP sections will be headed by well recognized experts in their respective areas. Jan Gruell, who will head the SOCIAL section, is a political scientist at the University of Akron's Institute for Future Studies and Research; she is also program director of the Ohio Policy Issues Network and editor of *Ohio Foresight*. Wally Albers, recently retired head of Operating Sciences (scanning, market research, decision and risk analysis) for General Motors Research Laboratories and now principal of a consulting firm specializing in management science and decision making, forecasting, and scanning, will be responsible for the TECHNOLOGICAL area. Stell Kefalas, professor of management at the University of Georgia and a specialist in international business and information systems, will be responsible for the ECONOMIC area. David Orr, department of environmental studies at Oberlin, and the author of several books on the environment, is responsible for the ENVIRONMENTAL area. The POLITICAL sector will be written by Graham Molitor, president of Public Forecasting, Inc., and vice-president of the World Future Society. Graham served as director of research for both of Vice-president Nelson Rockefeller's campaigns for the Republican presidential nomination and is author of over 200 articles and monographs on political forecasting. I will introduce the other members of the 1993-94 editorial board in my column in the October issue of Volume Two.

Nancy Blom, a research associate in the North Dakota University System, writes, "It is truly the only newsletter out of the scores of them that cross my desk that I read cover to cover. Why? Because the format is refreshing and USEFUL. You not only state what is going on in higher education, but you give us the impact and

Continues, p 16, col. 1

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Summer: A Time for Renewal*

*That includes newsletter subscriptions. See the enclosed form, or drop a note and a check to the address above.

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who are able to present portfolios of work products demonstrating academic competency.

Another striking example of the blurring of the line between education and employment has been the explosive growth of internship programs as the "fifth year of college." In the 1970s, Hunter & Schmidt showed that a trial job assessment is more than twice as accurate as a grade in predicting a person's subsequent job performance. Conversely, David Rock at the Educational Testing Service in Princeton has shown that a college curriculum that involves students in faculty research projects, rigorous student interaction and extensive out-of-class experience, produces graduates who consistently achieve substantially higher scores on the Graduate Record Examination than do non-involved students.

The data are compelling: experience is a superior teacher, and performance is a superior measure of competence. Internships must become an integral component of post-secondary education and the principal bridge between school and the workplace by the end of the decade. As the employment manager for Apple Computer was recently quoted in *The Wall St. Journal*, "To be honest, without work experience and other extras, a college degree now is really like a high school diploma."

The 1989 MIT Commission on Industrial Productivity concluded that, "Without major changes in the ways that schools and employers train workers over the course of a life-time, no amount of macro-economic fine-tuning or technological innovation will be able to produce significantly improved economic performance and a rising standard of living." The handwriting is on the wall. Western scholarship cannot plausibly survive untransformed by the dramatic changes now sweeping through their economic, technological and social environments.

Colleges and Universities Are Cash-Guzzlers

The traditional college is a notably inefficient "cash-guzzler," the educational equivalent of Detroit's gas-guzzling cars of the 1960s and 70s. The high cost of a bachelors degree has recently given rise to proposals to reduce undergraduate study to three years. The present basic productivity of classroom instructional methodology is relatively ineffective. One-third of today's graduates possess little or no added marketplace value: diplomas and grades are only 10% to 20% better than flipping a coin as predictors of job performance.

Institutions of higher learning must devise means to incorporate experiential learning into their instructional repertoire. Northern Europe, where 1/3 to 1/2 of the university graduates come through apprenticeship programs, provides working models of such arrangements. To remain globally competitive, the U.S. must initiate an explosive growth of internship programs. Colleges and universities must offer timely opportunities to integrate higher education and high-tech employment through partnerships with public and private sector employers.

College and university faculty can use their classrooms as test-beds for developing the content for graphic curriculum—delivered via CD/ROMs and interactive video-discs—to serve that 1/3 of the population who learn best visually. Distance learning via instructional television can significantly reduce the cost of delivering the traditional classroom lecture.

The markets for which higher education prepares its graduates are changing like the patterns of a kaleidoscope.

Experiential Education

The adoption of experiential and visual electronic instructional delivery substantially expands the potential reach of higher education while improving its economic efficiency. Within 10 years, it should be possible for the average college to electronically integrate its teaching, learning, staff development and research functions among its faculty, students, administrators, and experiential learning partners to become a "virtual university," with activities going on throughout the world, and educational services lasting the duration of each student's learning life-time.

The real challenge facing America's colleges and universities as the nation begins the second half of its generation-long transition from labor-intensive production to information-intensive production will be the redesign of their curriculum content. The markets for which higher education prepares its graduates are changing like the patterns of a kaleidoscope. Most new professional, technical, and managerial jobs now require a broadly sophisticated mix of applied math, scientific method, subject-matter knowledge, graphic literacy and reasoning skills, rather than the deep, narrowly focused competencies provided by traditional higher education.

The range of innovations described above will take years to institute, refine, perfect, and regularize, even under ideal conditions and the most effective leadership. Our nation will continue to be long on social needs and short on discretion-

ary funds for the rest of the century; consumers increasingly will be forced to deal with higher education as a commodity, to be purchased at the lowest cost.

Long-established institutions of higher education are already feeling the competitive pressure from aggressively market-driven community colleges. In response, some major colleges and universities are presenting themselves as uniquely superior, scholarly, research-based centers of knowledge creation and transfer. The sole aim of these institutions seems to be to get the Federal government to underwrite more funds for a continuation of "business as usual."

The Clinton Administration is promoting, with wide-spread public support, expanded tuition loans and a national service program to offset these loans. Until the marketplace value of the typical college degree has been demonstrably improved, this would be a poor investment. It would be much more productive to use these scarce resources to create a broadly literate and technically competent citizenry, rather than producing a lesser number of narrowly trained specialists. In this respect, tax incentives for apprentice and intern programs would surely be in order.

American Higher Education—the 21st Century

At a time when business leaders are re-engineering corporate America and when reforms from local communities to the White House are diligently re-inventing government, it is inconceivable that our venerable and valuable institutions of higher learning can, or should, remain untransformed. One way or another, American higher education must be led, prodded, pushed, cajoled or dragged, kicking and screaming, into the 21st century.

Social

Prevention: A World Health Strategy

The 20th century has seen unprecedented gains in human health and survival, with average life expectancy for newborns worldwide doubling from about 30 years in 1900 to 64 years in the late 1980s. The world's elderly population will swell by 114% between 1990 and 2020; by 2020, 67% of the 706 million persons over age 65 will live in lesser developed countries (LDCs). A revolution in health strategy is required to address the health challenges of the late 20th and early 21st century (e.g., sexually transmitted diseases, HIV, and smoking).

A revolution in health strategy is required to address the health challenges of the late 20th and early 21st century.

In the first three decades after WWII, the major thrust of health programs was biomedical and technical. By the 1970s, there was growing evidence that a hospital-based, curative strategy was failing to meet health needs and was increasingly expensive. In wealthy countries, it became increasingly apparent that many chronic diseases among adults resulted from unhealthy behavior, diet, and lifestyle. Many of these countries have developed strategies for encouraging healthy lifestyles, in an attempt to resolve this problem.

In LDCs, it became clear that the Western medical model of urban-based hospitals was not meeting health needs. A few LDCs have focused their health systems on reaching all the people with essential services, and promoting basic hygiene and good diets.

The international donor community translated the primary health movement into a global child-survival strategy. Promoting healthy lifestyles and child survival should be looked at as precursors of a revolutionary shift in worldwide health policy and program strategy. The preventive approach to improving health recognizes that all sectors of society must be involved in the production of health.

[Mosley, W.H. & Cowley, P. (1991, Dec) The challenge of world health. *Population Bulletin, 46* (4), 1-39. Adapted from *Future Survey*, (1992, Nov)].

Cancer Prevention: A Change in Lifestyle

Cancer is now the leading cause of death for women in the U.S. If trends continue, it will be the leading cause of death for both men and women by 2000. This is not so much due to the cancer mortality rate (which has increased by a modest 6% between 1950 and 1987) but to the remarkable and consistent decline in heart disease mortality (which has fallen 55% of its rate in 1950) resulting from reduced prevalence of major risk factors.

Recently there have been major changes for some individual cancer types. Since 1973, mortality caused by Hodgkin's disease, and cancers of the cervix, uterus, stomach, rectum, testis, bladder, thyroid, oral cavity, and pharynx has declined more than 15%. These decreases are believed to result from

changes in food preservation practices and consumption patterns, as well as early detection and treatment. Since 1973, increases in mortality of more than 15% have occurred for lung cancer, melanoma, non-Hodgkin's lymphoma, and multiple melanoma. Increases in incidence of more than 15% (but not in mortality) have occurred for kidney, prostate, breast and brain cancer. (The increase in brain tumors is largely explained by CAT scanners that diagnose otherwise "silent" tumors.) Tobacco, alone or in combination with alcohol, remains the most important cause of cancer, accounting for about 1 in 3 U.S. cases. There is sufficient knowledge to move energetically toward the prevention of a significant proportion of human cancer. Contrary to popular opinion, environmental pollution is not a major cancer hazard. The majority of cancer causes (tobacco, alcohol, animal fat, obesity, ultraviolet light) are associated with litestyle.

[Henderson, B.E., Ross, R.K., & Pike, M.C. (1991, Nov). Toward the primary prevention of cancer. *Science, 254*, 1131-1138. Adapted from *Future Survey* (1992, Nov)].

Implications

Both of these articles imply that prevention is a major international health strategy that opens the door to new collaborations between the social sciences and the biomedical sciences.

. . . prevention is a major international health strategy that opens the door to new collaborations between the social sciences and the biomedical sciences.

Many of the world health problems will not be resolved without social change. For example, research on iron deficiency in rural Chinese children has shown that government interventions have been ineffective because of pervasive fears of genocide in the minority population. Although the intervention is simple and effective (e.g., the introduction of salt tablets to the diet), the social obstacles are enormous. This medical condition will be resolved only when a socially acceptable intervention is devised.

A similar situation is found for heart disease, AIDS, and lung cancer in the Western world. We have the knowledge to significantly reduce the incidence of these conditions, but we lack the social knowledge and/or the social will.

How does this affect higher eduction? Proactive colleges and universities must assume their responsibilities and develop opportunities to facilitate the interdisciplinary interchange to solve these problems. Duke University, for example, has established he Center for Living, a multidisciplinary research and intervention program to reduce the incidence of heart attack. Individuals at risk are referred to the Center where social and medical issues are addressed in an integrated *holistic* manner.

Institutions of higher learning have a responsibility to their students to raise the consciousness of personal health issues and personal decision making so that the next generation can appreciate the health risks involved in individual behavior. This is simply one piece in the larger picture of social responsibility.

Technological

The Pentium Is coming! The Pentium Is Coming!

Intel Corporation's long-awaited Pentium CPU (central processor unit) computer chip has recently been released into the marketplace. This chip promises to represent one more in a long line of remarkable advances in computer chip technology in desk-top and laptop personal computers (PCs). The Pentium chip provides capabilities for PCs that only a few short years ago were available only from mainframes. We ordinary citizens can have at our fingertips in our home or office all the computer power and speed that was incredibly difficult to access and pay for just a little while ago, at a cost that fits many of our budgets.

The Pentium chip also represents a milestone in the battle with Japan for the global market share of semiconductor electronic chips. According to the market research firm, Dataquest, Inc., U.S. chip manufacturers are regaining lost market share from the Japanese and will account for about 34% of the world demand in a year, up almost nine percentage points from the 1991 figure. This is a very encouraging sign for the U.S. electronics industry, and for our nation's balance of trade problem.

The computer hardware advances resulting from the Pentium applications will spawn an entire new cycle of innovative and creative software developments. We can start looking for many new developments in operating systems, applications and utilities for PCs that will get more and more user-friendly. And you can also bet that the competition among the U.S. software firms such as the Microsofts, Novells, and Borlands will heat up substantially. [Feibus, M., & Slater, M. (1993, April 27). Pentium power, *PC Magazine*, pp. 108-120)].

Implications

Look for dramatic improvements in computerized teaching aids at the higher education level, particularly in the science and engineering areas of instruction. The solutions of complicated equations and the manipulation of large data sets will be much easier on PCs than ever before, opening new doors for the innovative educational software professional.

Voice Recognition Coming Into Its Own

Speech-recognition technology appears to be outgrowing the several irritating limitations that until recently have confined it mostly to the laboratory. The market now includes a number of commercially available products that allow a user to give voice commands to computers, VCRs, and automobiles, among other things, thanks to the merging of speech recognition research with a branch of linguistics called natural-language studies. This integration of acoustics with syntax and semantics, catalyzed by grants from the Federal government (ARPA), enabled researchers to program dictation systems to resolve the many ambiguities of the English language. The system can differentiate between words such as "hour" and "our" or "two" and "too." The ability to interact with a computer that recognizes and differentiates between the spoken word choices should give new meaning to the phrase "user-friendly" when it comes to PCs and lap-top computers. The possible elimination of the keyboard has great significance for the nontypists among us. We do, however, still have quite a ways to go to chat with a computer the way the astronauts conversed with HAL in the movie *2001:A Space Odyssey* [Bylinsky, G. (1993, May 3). Next step—computers we can talk to. *Fortune*, pp. 88-91].

Implications

New degrees of freedom would open up to student and teacher alike if an instructional PC could provide speech recognition. Enormous gains in efficiencies in the learning process could occur, with the innovative combinations of sight and sound providing improved retention and assimilation. Academics should be researching the technology of voice recognition and the cognitive processes related to the speech/vision combination, in order to accelerate application of this technology to the learning process. This technology could be the key to reducing the time to complete the requirements for the baccalaureate degree.

The Changing Personalities of R&D Labs

All through the cold war the U.S. National Laboratories carried out R&D for defense under a cloak of secrecy and without much regard for the cost of producing products such as a weapons system. With the break-out of peace, these same laboratories are being asked to help boost national competitiveness by performing R&D to help industries manufacture more at lower cost. These laboratories are switching from a cloak-and-dagger mentality to a cost-effective mentality.

This is foreign territory for the National Laboratories. The transition is proving somewhat more difficult than expected, but progress is evident. The number of cooperative research and development agreements (CREDAs) between industry and U.S. Department of Energy Laboratories reached 400 in May of 1993, up from only 15 in April of 1991. Similar data are reported for the Department of Defense Laboratories. Of course the jury is still out on how effective the National Laboratories can be in accelerating our nation's technology transfer and increasing productivity. But it is increasingly clear that the effort is underway. [Carey, J., Hof, R.D., & Atchison, S.D. (1993, June 7). Firefight over the weapons labs, *Business Week*, pp. 104-106].

Implications

Until recently there has been a division-of-labor in R&D in the U.S. Academic institutions pursued fundamental or basic research and development studies; industry laboratories (and some government laboratories) looked after applied aspects of R&D. Most defense-related R&D was confined to the specialized government laboratories. The entry of the National Laboratories into the commercial, non-defense areas of R&D is contributing to a redistribution of this old order division-of-labor. Academic institutions that have traditionally relied on government and industry funding for their R&D dollars must rethink their strategies for acquiring funds. The shift of the well-funded National Laboratories from defense to non-defense related R&D also constitutes a new source of competition for basic R&D, an academic stronghold in the past. Plan, plan, plan. *The technology section was written by Walter A. Albers, Jr., Albers Systems, Inc.*

Economic

Think Strategically, Globally, and Futuristically

In the April 1993 issue we traced the sequence of events and trends that led businesses to adapt to environmental changes by refocusing their scope and scale of activities. Business managers experienced a Janus effect: looking outward they saw a vast globe full of opportunities; looking inward they saw a huge, bureaucratic machinery unable to keep up with the magnitude and frequency of changes in their global environment. The remedy was obvious. If the world changes drastically and frequently, so must the firm's strategy and structure. The rule: see the world as your oyster and while thinking about tomorrow, act today.

The slogan of the World Future Society in its first international meeting in Toronto, Canada, was "Think Globally, Act

Locally." Take the entire globe into consideration, but act in your own organization. Firms that followed this advice and survived, discovered that global involvement is a long-term commitment of organizational, human, and monetary resources. They discovered that the slogan pertaining to space must be supplemented with a slogan for time, one that could be phrased: "Think Tomorrow, Act Today."

During the decade of the 80s those businesses reached overseas to outsource, joint-venture, and build strategic alliances. American universities, with few exceptions, followed Peters and Waterman's advice and stuck to their knitting in their search for excellence. Most universities are still searching for excellence by creating Excellence Centers, or Centers of Excellence. Most of these centers adopted ambiguous mission statements that told of their university's intention to serve their constituents (the state folks) using their own resources and resident faculty who are now elevated to the envious position of research professors or fellows of centers of excellence. Rigorous guidelines were drawn up by the university administrators that mandated quick results. Thus, the slogan became: think locally, act locally and *immediately*.

What must educational leaders do in order to think strategically? First, they must break down walls: the first wall that must go is the national geographic border. The second is short-time thinking.

Think Globally, Act Locally

American universities are the envy of the world. As most of us educated in more than one mind-processing system know, once we were exposed to the American educational system everything else looked boring. American universities offer the best educational environment for both students and faculty. This educational climate is the greatest asset of most American universities.

What do *businesses* do when they develop a competitive advantage? They exploit it. They use it to create as many tributaries of cash flow as possible. The more the asset is used, the more cash flow it creates, and the more it contributes to the firm's stakeholders' wealth. Firms search the globe to find potentially suitable asset users. They license the technology-based competitive advantage for a fee, they set up subsidiaries around the globe, and then, sometimes they sell the firm. The rule is: use it or lose it.

What do American *universities* do when they develop a competitive advantage? They watch the rankings. What *should* they do? There are literally infinite opportunities to generate additional resources for the university by going global. That of course requires some changes in the rules of the game. It assumes a willingness to share with other institutions and businesses around the globe information and knowledge created by the university's workers. Creating contractual arrangements with overseas institutions is a very lucrative strategy, both as a cash flow generating method and as a learning experience for university faculty, staff, and students.

Once this think-globally, act-locally mindset is adopted, its implementation is easy. We will deal with the implementation in subsequent issues under the topics of restructuring/re-engineering, empowering faculty, using human resources to their maximum, embracing information technology, and cooperating by forming strategic alliances.

Time: Think Tomorrow, Act Today

Management literature has made it abundantly clear that constraints become goals. As Nobel Prize winner Herbert Simon puts it, "If you allow me to determine the constraints, I don't care who selects the optimization criterion." The yearly ritual of budget discussion at the state or federal legislation level is, of course, the greatest constraint facing any university administrator. Legislative appropriation capabilities have been shrinking. Revenues are closely tied to economic growth, which is in turn linked to demographic trends.

What is a university to do? Minimize the risk of a budget cut by diversifying into sources of funding that are not dependent on a single state or national appropriation.

Finding alternative sources of funds is a long-term commitment. We simply cannot send students, staff, and faculty to the state or federal capitol to secure sources of funding. We must develop our own long-term sources of funding. For example, licensing and franchising curricula packages or even setting up off-shore/subsidiary campuses overseas could provide an excellent source of resources. In addition, these strategies will lower uses of funds at the main campus. Faculty assigned to these ventures will, of course, be paid by

the host institution, thereby freeing money for other domestic uses.

Many schools have senior tenured professors who, while they drain resources, contribute very little beyond an occasional esoteric paper to some equally esoteric journal. Yet they represent excellent assets if viewed differently. For example, instead of expecting a 50-year-old tenured professor to publish another paper, entice this professor to start a new venture overseas. If the professor is good in research, sign a joint research venture with an overseas university. If the professor is a good teacher, send him or her overseas to teach other professors the art of good teaching. The professor gets off the domestic payroll, frees resources, and at the same time enjoys the new experience, learns from it, and brings back new ideas (and some cash).

The university of the future will be the university that breaks the wall of national excellence and reaches out to become a globalist. To succeed in this globalization, the university of the future must shed its parochial and short-time perspective and become an open learning organization. *The Economics section was written by A. G., Stell Kefalas, Professor of Management, University of Georgia.*

Environmental

The Challenge

Institutions of higher education evolved in economic and ecological conditions that we know now to be unusual, perhaps unrepeatable. They reflect assumptions about technological progress that had their modern origins in the Enlightenment Era, and more particularly in the Industrial Age in which our prospects seemed unlimited. For much of the past 150 years, the United States was the strongest economic force in the world. Energy was cheap and abundant. The environment, and particularly the climate, was stable and resilient. Technology was dynamic and mostly unquestioned.

A different world is now emerging. The United States is the largest debtor nation in the world and is no longer the world's strongest economy. For both economic and ecological reasons, the era of cheap energy is drawing to a close. The earth's vital signs reveal stress and abuse virtually everywhere. Conservative estimates show that the emission of greenhouse gases will warm the earth by 2 to 4.5 degrees centigrade within the next century, causing unimaginable biological, economic, and social consequences.

Yale historian Paul Kennedy has examined these and related trends in his new book, *Preparing for the Twenty-first Century* . It is a book educators ought to read and read carefully. If the world of the 21st century turns out to be anything like Kennedy's forecast, many of the assumptions that underlie curriculum, the organization of knowledge, and even institutional operations are just not as true as they once were. Kennedy concludes by calling for "nothing less than the re-education of humankind" (p. 339), which implies that something was wrong with the kind of education that enabled us to industrialize the earth. Kennedy is right, I think, in believing that our capacity to respond effectively to the great crises of the 21st century will require a fundamentally different education, one that prepares the young to live harmoniously on a planet with a biosphere. Those now being educated will have to do what we, the present generation, have been unable or unwilling to do: stabilize world population now growing at the rate of a quarter of a million each day, reduce the emission of greenhouse gases that threaten to change the climate, perhaps disastrously, protect biological diversity now declining at an estimated 100-200 species per day, and conserve soils being eroded at the estimated rate of 65 million tons per day. The present generation must learn how to use energy and materials efficiently. Civilization will have to run on sunlight. Future generations must rebuild the economy in order to eliminate waste and pollution. They must learn how to conserve resources for the long-term. They must begin the great work of repairing, as much as possible, the damage done to the earth in the past 200 years of industrialization. And they must do all of this while reducing poverty and egregious social inequities. No generation has ever faced a more daunting agenda.

For the most part, today we are still educating the young as if there were no planetary emergency. It is widely assumed that environmental problems will be solved by technology of one sort or another. Better technology can certainly help, but the crisis is not primarily one of technology. Rather, it is one of mind, and hence one within the minds that develop and use technology. The disordering of ecological systems and of the great biogeochemical cycles of the earth reflects a prior disorder in the thought, perception, imagination, intellectual priorities, and loyalties inherent in the industrial mind. Ultimately, ours is a crisis of education that merely purports to shape and refine the capacity of minds to think ecologically, to imagine what could be and is not, and to act faithfully. Resolution of the great challenges of the next century will require us to reconsider the substance, process, and purposes of education at all levels. Is this possible?

In *The Idea of the University*, another Yale University historian, Yaroslav Pelikan, has recently questioned "whether the university has the capacity to meet a crisis that is not only ecological and technological, but ultimately educational and moral." Pelikan questions "the readiness of the university community to address the underlying intellectual issues and moral imperatives of having responsibility for the earth, and to do so with *an intensity and ingenuity matching that shown by previous generations in obeying the command to have dominion over the planet*" (emphasis added). This, I believe, is the great challenge now before higher education. Will colleges and universities, the very institutions responsible for inducting young people into adulthood, respond with "intensity and ingenuity" to environmental deterioration that is undermining the world the young will inherit? [Pelikan, Y.

(1992).*The idea of the university*. Yale University Press, pp. 20-21.] *The environmental section was written by David W. Orr, Environmental Studies, Oberlin College.*

Political

Charter Schools—an Alternative to Education Voucher Programs

Charter schools, already instituted in two innovative states—Minnesota in 1991 and California in 1992—are under consideration in 11 more states. Under these new laws, teachers are empowered to contract for organizing autonomous schools that emphasize some special subject or learning style.

Charter schools exist within the traditional public school system. Though freed from burdensome traditional regulation and given flexibility to pursue unique new learning experiences, they must meet specific student performance criteria. [Staff. *State Legislatures* (1993, May) *19* (5), 10].

Implications

This alternative institutional approach expands student choice and leads to an increasing emphasis on educational specialization. Some proponents contend that wide choice and increasing specialization could offset the push toward vouchers that would allow recipients to pay for education in the forum of their choice. Although applied to secondary schooling, the principles could carry over to higher institutions of learning and to continuing education programs.

Second College Degree Cost Could Be Upped Four-fold

Buffeted by perennial funding shortages, the California legislature recently directed substantial increases in tuition for full-time students seeking a second college degree. Tuition at the 20 universities throughout the state for full-time resident students currently runs approximately $1,500 per year, and has been raised to $5,800 per year for full-time students pursuing a second bachelor's or master's degree. [Staff. *State Legislatures* (1993, May) *19* (5), 10].

Implications

Administrators fear that the large increase in costs will discourage most students from seeking second degrees. At a time when increasing education looms ever larger in importance, does it make sense to establish disincentives to pursue multiple degrees?

Incentives for Upgrading Worker Skills

Enhancing worker skills and making employees more competitive has become a demanding requirement in an increasingly competitive marketplace. Many programs aimed at upgrading job skills have been established over the past decade. West Virginia is among the states that took steps to encourage local businesses to improve worker skills. West Virginia's Governor's Guaranteed Work Force Program provides up to $1,000 per employee for updating and otherwise enhancing employee skills. The incentive is available to new or existing businesses. [Staff. (1993, April). Connections: Total quality employees. *Governing*, *6* (7), 15].

Implications

Will government continue to look toward the private sector to support learning?

Worker Training: Shift in Emphasis from Assisting Disadvantaged Workers to Upgrading Job Performance

The new emphasis is on improving job skills of new entrants and enhancing capacity of workers already on the job, workers already making it.

Over the past 30 years, the emphasis in job training pursuant to the Manpower Development and Training Act, Comprehensive Employment and Training Administration, and Job Training Partnership Act has been keyed to assisting the disadvantaged—disabled, dropouts, minorities, youth, and dislocated workers. The new emphasis is on improving job skills of new entrants and enhancing capacity of workers already on the job, workers already making it. The shift is away from the safety-net emphasis. The new hallmark is toward bringing into play higher skills required by more demanding Information Era jobs. Advanced industrial societies, like the United States, no longer are in a position to compete with labor intensive jobs, particularly those associated with previous Industrial Era enterprises. Industrial nations are no longer able to pay top dollar for low-skilled jobs. Industrial jobs involving fragmented tasks that can easily be performed with only a minimum amount of training, are naturally gravitating to low-labor-cost countries. [Liddell, S. A. (1993, May). Putting the future on the high (skills) road.

State Legislatures 19 (5), 8-22].

Implications

In an increasingly globalized economy, American Information Era jobs will require careful nurturing of higher level skills, analytic capabilities, and computer capabilities. Second rate educational achievement eventually translates into a second rate economy. If the American dream of a full and affluent life is to be fulfilled, education at all levels cannot be allowed to drift.

Redressing the Imbalance Between Educational Preparation for College-Bound and Non-College-Bound Highschoolers

One program championed by President Clinton entails establishing youth apprenticeship programs that link educators with businesses. European experience in this area is light years beyond the U.S., and much can be learned from their experience. A tentative approach unveiled by the Administration involves three tiers:

- Basic 3 Rs curriculum through grade 10
- Emphasis on communication skills, analytical thinking, and problem solving for grades 11 and 12, combined with on-the-job internships in chosen fields of interest
- Technical and professional skill-building emphasis during grade 13.

Certificates of mastery for various disciplines would be cooperatively developed by educators and business interests. Uniform standards would be devised to assure consistency among the several states. Funding amounting to $270 million for 1994 would rise to $500 million by 1997. The $1.2 billion cost might be difficult for Congress to pass, at least until addressing deficit spending and the $3.1 trillion national debt. [Liddell, S. A. (1993, May). Putting the future on the high (skills) road. *State Legislatures 19* (5), 8-22].

In an increasingly globalized economy, American Information Era jobs will require careful nurturing of higher level skills, analytic capabilities, and computer capabilities.

Implications

Are college bound high school students pampered and favored? If so, what should be done about the forgotten half of high school graduates who don't enroll in college? What should be done about the nearly one-fourth of students, 20 million of them, who drop out prior to completing high school?

Training Tax Amounting to 1.5% of Payroll

Upgrading worker training, a Clinton campaign theme, would mandate that businesses with over 100 employees either spend 1.5% of payroll for training or pay an equal amount into a federally controlled training fund. U.S. firms recognized for their outstanding worker training, Xerox, Motorola, and Hewlett-Packard, spend in excess of 3% of payroll for employee training. Among comparable Japanese companies, about 6% of payroll is spent for worker training.

Upgrading worker-training could amount to as much as $17 billion in added costs. U.S. firms already spend an estimated $30 billion for worker training; much of this expenditure goes to upper management and higher skill jobs. The Clinton plan would be designed to assure training that reaches down into all ranks.

Australia enacted a similar Training Guarantee Act several years ago. Down-under, all domestic firms with payrolls in excess of $200,000 Australian dollars were required to spend 1.5% of payroll for training. The onus of this requirement fell most heavily on small businesses that had been providing no training. Big businesses felt little additional burden because most were already spending more than 1.5% for training. What did sting the big companies was the additional paper work required for accounting and reporting, which added nothing to training. [Liddell, S. A. (1993, May). Putting the future on the high (skills) road. *State Legislatures, 19* (5), 8-22; *Reason*, (1993, March), p. 10].

Implications

With education achievement faltering, employers in the public as well as private sectors are likely to be called upon to pick up the slack. Government mandates specifying a fixed percentage of payroll for educational purposes almost certainly will increase funding for continuing education. As education costs soar, employer assistance will help assure that worker skills keep pace with the times.

Social Indicators: Key Statistics That Drive Education Reform

Tuition, room, and board at the most expensive U.S. College (Bennington) is $17,790 per year. Compare this with incarceration costs per prison inmate, which range between $24,000-$50,000 per year.

Implications

Misplaced priorities: why should society spend more to jail a person than to send a student to college? Taxpayer revolt looms as increasing crime swells the prison population and requires huge outlays to build additional jails. *The political section was written by Graham T. T. Molitor, President of Public Policy Forecasting, Inc. and Vice President of the World Future Society.*

Why should society spend more to jail a person than to send a student to college?

Books

School's Out: Hyperlearning, the New Technology and the End of Education

Reviewed by Theodore C. Kraver Learning/Research/Enterprise Inc.

Lewis Perelman applies an outstanding collection of resources, from his Harvard doctorate to his directorship of Hudson Institute's Project Learning 2001, to his book *School's Out* (1992). He concludes that transforming education makes as much sense as transforming the horse. Research on horses could not have transformed them into automobiles or produced a modern transportation system. Perelman believes schools (kindergarten through university) will not evolve into an appropriate learning system for the information age. This opportunity will be seized by Hyperlearning (HL).

The supply-side driver is software, computer, and communication technologies that are doubling in capability every 2 to 3 years. The market-side driver is education's staggering 93% labor costs, one of the fatal manifestations of our socialistic educational system. As the competitive market emerges, the current educational system will simply be replaced—by HL.

Perelman asserts that overeducation has become a "Solid Gold Life Jacket"; that effective schools are a myth; that educational goals continue to be a fiasco; that school choice is a diversion; that "New American Schools" are a charade; and current public school reform efforts are pseudo-innovation. Provoking or provocative or both, Perelman's conclusions are supported by a strong foundation of facts and research.

Perelman can find almost no connection between what passes for research in our colleges of education and the real science and technology of learning. He says that even if a researcher made a tremendous breakthrough in learning research, there is no effective method to deliver this innovation to the professor or student without a commercial learning industry.

Perelman's framework is the real world of innovation as practiced by our other major industries. He demonstrates the impossibility of effective innovation in the $500 billion education industry when R&D funding is less than 0.1% of expenditures.

The market for learning technology is very weak in our educational system. Capital investment in productivity tools per teacher-worker is less than $1,000. For the real workers, the students, capital investment is less than $50. Competitive service businesses invest 10 times more per worker. For high technology businesses the figure is over 100 times higher.

Currently only a few dozen small military and university based institutes and laboratories are working on HL technologies. The largest, the Beckman Institute for Advanced Science and Technology, with 600 professors and students, investigates mind, thought, and learning. This research effort pales in comparison with federal and corporate research on energy, aviation, health, electronics, and agriculture.

Perelman's proposed action steps may incite controversy among educators, but they are a normal way of life for innovative business and governmental agencies. For education, Perelman advocates outlawing credentialism for all hiring. Our current credential system ejects the failures and hands out a seal of approval after the students have passed final inspection at the end of their education. He says the Total Quality Management approach of HL will produce learning that is nearly defect-free during the continuous learning process. Concurrent records based on assessment and achievement will replace awards for blocks of seat-time.

Accountability on the part of educators should be seen as that of *competitive vendors*—not just teachers, professors, schools, colleges or public bureaucracies;to the *consumer*—not to politicians or academics; achieved in *real time*—not in a few months, years or decades; as measured by *competency*—not by credentials or proof of attendance.

Not only does Perelman articulate the causes for the lack of innovation in schools, he prescribes a solution based on the synergistic integration of learning, research and enterprise. HL will bypass the current systems of education. Focus will shift to distance learning that rides on the emerging national information infrastructure, and commuters in the home and workplace. Privatization should be the primary goal of re-structuring the economics of learning.

A funding innovation will trigger this privatization. Macro-choice of schools is too blunt an instrument. The learning customer must have micro-choice for all levels of education. In HL, state-provided debit cards will be used to purchase education from any provider, from anywhere on the globe, in the format most effective for the customer.

HL opportunity will be accelerated by investing 3-5% of annual expenditures ($8 billion to $20 billion) in R&D, innovation, and commercialization of the HL systems. The supply-side will receive at least 2% of state budgets of public supported education for R&D, to be matched with local funds. The set-aside of another 2-3% will increase productivity through learning technology by investing in the commercialization of the learning products and services.

A National Institutes of Learning (NIL) will be created, of a size comparable to the National Institutes of Health (NIH). The NIH has a $9 billion R&D budget. The U.S. Department of Education spends only a few million dollars on advanced learning technology.

Perelman recommends replacement of our wasteful education college diploma mills with a network of Institutes for Learning, to develop learning professionals through HL and on-the-job training.

Perelman's book moves beyond the debate on educational reform. It develops a new paradigm to address the knowledge-age through learning, research, and enterprise. *School's Out* is actually a market research study for software, communications, and learning service entrepreneurs. The global opportunity for HL will render obsolete our current form of education and training.

Whether or not the HL transformation will take place is not the issue. Perelman builds a strong case that it will happen. The central issue is whether we fight the opportunity and become losers as students and learning professionals, or as a country apply our national talent for innovation and exploit this opportunity for the benefit of all. *School's Out* is an excellent guide for making this very personal and institutional decision. [Perelman, L. (1992). *School's out.* New York: Morrow].

THE SITUATION ROOM

The Media and Its Changing Nature

Richard Heydinger, University of Minnesota

Any list of factors developed as part of environmental scanning would be incomplete if it did not highlight the changing role of the media. All higher education institutions need a clear and unambiguous media strategy, crafted in light of today's media, not yesterday's.

A few trends in the media are obvious. The electronic media has become portable, with miniature cameras and recorders now smuggled into classrooms to tape unsuspecting professors. The level of sensationalism in the media is increasing. Violence, stories of scandals, and graphic images that were taboo even a few years ago are part of the daily fare.

Examples of not-so-obvious changes in media operations are the increasing number of prime time shows devoted to current affairs and current social issues. These shows are quick and cheap to produce. The nightly newscast and the growing number of TV tabloids often cover the same issues. The demarcation between real news and "augmented" news has become blurred. Recently, higher education issues such as sexual harassment and tuition hikes have become topics for TV tabloids. The coverage of an individual human drama, usually reflecting larger trends, may be the subject of in-depth reports. The stalking of a student by her ex-boyfriend may be the lead-in, the "tease," in the nightly news.

As recent data show, managerial crises now receive more coverage than operational failures. The public grudgingly accepts product failures, but they will not accept scandals or poor judgments. Events such as the Anita Hill-Clarence Thomas incident unleash a wave of news coverage on a specific topic (e.g., sexual harassment).

As the thirst for stories continues to grow almost unabated, certain characteristics of higher education make us particularly vulnerable to increased press scrutiny. We pride ourselves on giving all our constituents license to speak their minds. Student protests are controversies virtually staged for media coverage.

The highly intense personal nature of the educational process at its best can often become, at its worst, attractive fodder for news stories. Our highly decentralized, let-it-all-hang-out, environment is a rich vein of ore for mining if you are an enterprising reporter.

Couple these characteristics with the price of education that takes an increasing portion of a family's real income and you have a recipe for more press coverage, not less.

In the spirit of the Situation Room, let's examine some

strategies for these changing conditions. Dealing with the media is often counter intuitive. First: What should we not do in planning a media strategy?

We cannot change media objectives. News, by definition, is controversial and affects large numbers of people. We cannot turn back the clock and wish that the local newspaper editor were a booster for our local college. We cannot expect the media to place the institution's good stories on the front page.

We are short sighted if we attempt to limit media access to our campuses. The press rightfully feels that our colleges are carrying out the public's business, whether we are public or private. We are also mistaken if we think we can control what our own people say.

What can we do? In the spirit of issues management, each institution must develop a plan for working with the media. The plan must include protocols for crisis situations and a longer range plan to cultivate a working relationship with the media. In times of crisis, the protocols should call for the identification of a team to track and assemble all the necessary information. A single spokesperson should be identified to respond to reporters' inquiries, to tell our side of the story. If not, the space will be occupied with someone else's comments. We must take time to fully inform faculty, staff, and students so they will have the facts should a reporter ask for their opinions.

For emerging issues, we must assemble and analyze data from the perspective of an interested reporter. We must consider releasing a story in advance of the media's discovery, and on our terms rather than on theirs. Regular contact with the media and a good working relationship with our media-relations staff are essential.

The media's scrutiny of higher education is a trend that will intensify in the years ahead. We must be prepared with strategies that will build on this emerging trend and not sit off to the side lamenting these contemporary facts of life. (If you wish to write about an issue facing higher education, please contact Rick Heydinger, Alliance for Higher Education, 203 Burton, University of Minnesota, Minneapolis, MN 55455 [ph: 612 - 624-8586; fax: 612 - 626-7496]. Rick is particularly interested in the restructuring of higher education. He would like to hear from others with similar interests.)

COMMENTARY

From an Age of Specialization to an Era of Integration

Ed Dalton, Futures Unlimited

The world is moving from an Age of Specialization to an Era of Integration. For a long time, we achieved improvements in productivity by increasing specialization of three areas — task (the number of separate operations that must be performed to accomplish a job), labor (the number of different people who perform the operations), and knowledge (the amount of information that each contributing worker has about the entire picture).

Globalization means more than just selling products and services in other countries.

The more specialized the work became, the more coordination of the pieces was required. This led to the rise of middle management and staffs. Layers and layers of management emerged whose job sometimes amounted to nothing more than putting back together the pieces that specialization had separated.

Specialization has a point of diminishing returns, and we have passed that point. Excessive specialization has led workers to feel powerless; their jobs no longer have meaning. Too many management layers have stifled initiative and creativity and turned companies into lumbering giants unable to respond quickly to today's rapid changes in technology and markets. The costs of the specialization-coordination pattern has risen faster than the benefits.

The world is becoming integrated, customized, individualized, and yet global. Organizations that continue to focus through lenses that recognize only the specialized, mass-produced, mass-consumed, and local will see increased chaos, turbulence, and uncertainty.

Four Forces for the 90s:

• Globalization: Globalization means more than just selling products and services in other countries. It means the earth is the limit for where organizations get raw materials or where they locate plants. It means marketing to many different local markets, not to a single homogeneous one. It means a company can base its headquarters in Europe, build its factory in Taiwan, and sell its product in Canada. The European Community-directed economic unification of Europe will add a new dimension to the rules of global commerce. The recent events that have swept Eastern Europe and China will further

complicate the global puzzle.

• Multiple Stakeholders: Satisfying multiple stakeholders' demands is an idea that is spreading like wildfire. A corporate executive used to serve one primary master—the stockholder; earnings per share measured success. Now we acknowledge that the stockholder is not the only one with a stake in the business. We see the stockholder as just one of many; stakeholders include customers, employees, suppliers, regulators, and even community and environmental advocates. As Peter Drucker has noted, the business executive now must function like a university head or a hospital administrator and try to balance the often conflicting needs and demands of all stakeholders.

• Environmental Concerns: The problems of our natural environment have become front-page news. We must vigorously examine the relationship between business and the world in which it operates. The greenhouse effect, holes in the ozone layer, endangered water supplies, disposal of waste—hazardous, toxic, and voluminous—are issues that demand attention.

• Labor Shortage: The shortage of qualified labor in developed countries is a growing problem. Available jobs call for fewer and fewer unskilled workers and more and more workers with specialized skills. Our problem in America arises in part from the baby bust and the weaknesses in our school systems, which have combined to produce a shortage of people capable of mastering the skills required for tomorrow's work.

When we take another look at these forces, this time through the new lenses, each of them can be seen to relate to a shift from specialization to integration:

Globalization (e.g., the unification of Europe) means integrating the separate pieces of our world into one global economy.

Multiple stakeholders means integrating the interests of many separate parties into a new concept of the unified interest of the whole corporation.

Environmental concerns means integrating organizations and the physical environment in which they operate.

Labor shortage means upgrading qualified labor in developed countries through increased involvement in education and training, integrating the corporation with the society from which it draws both its customers and its workforce.

We have moved from an Age of Specialization to an Era of Integration. We must view the world in a new way if we are to attack successfully the problems and opportunities that face us.

Tools

Thinking About Tools—Part One

Bernard Glassman, Pragmatix InformationDesign

Whether institutional research is a small portion of your overall responsibility, or you are one among many in your institution who are part of a full-time institutional research team, you traffic in information that must be used to measure past performance against objectives, and objectives against one or more probable futures. Survey results, newspaper clippings, publications like this, listserv digests, staff and student and regional demographics, faculty publications and citations and other indicators of departmental productivity, planned versus actual budgets . . . it's no wonder that after we evolve a means of keeping information chaos at bay we resist anything that smacks of change for change's sake.

So it's equally small wonder that an office can spend several hundred dollars on classified advertising to find staff, from secretaries to research associates, who will claim the ability use the existing, tried-and-possibly-true, brand of software that could have been emulated by other, easier-to-use software costing $99 that almost anyone could have used. More on that in a moment.

While we are considering the merits of the various arguments in this and other media to rethink, re-engineer, re-invent, restructure and regroup, we should look at the the handling of information in our own bailiwicks and ask whether there is a discrepancy between the way it is actually being done and the way we envision the workplace of, not just tomorrow, but today. Was someone "promoted" to network administrator because of a demonstrated ability to read a word-processor manual? Are we using SAS and SAS programmers to manage numbers that recent spreadsheets (Microsoft Excel is but one example) can handle just as readily, and display far better, at a tiny fraction of the cost? Is all of this happening because it is still possible for one entrenched individual to pose as a computer guru?

Ultimately, the way information is handled is at least emblematic, probably symptomatic, and possibly diagnostic of what is right and wrong with an institution. Indeed, the difference between information and every other kind of thing-of-value challenges the concept of *institution* as we think about it today. So as we think about our institutions, let's think hard about the tools we use to understand, sustain and change those institutions. An educational organization, like an entire civilization, that permits its tools and tool-users to dictate the present, need not wonder for long whether it has a future.

From the Editor (continued from p 3)

implications. You make me recognize 'the bigger picture.' Keep up the great work!" Many thanks for those kind words, Nancy.

In another letter to the editor, Theodore Micceri, University of South Florida, commented on an article in our preview issue concerning the Boren bill. We had said that the bill, which supports undergraduate study abroad and graduate training of language and area studies specialists, will be a step toward equipping students with the cultural and linguistic expertise to compete effectively in the new international environment. Ted agrees that multicultural expertise provides benefits, but contends that linguistic expertise is not required of English speakers because English is "the closest thing to an 'international language' throughout the world. . . particularly . . . among nations that are involved heavily in international trade." Ted says that a variety of agencies in foreign countries offer English language training programs due to the need to communicate with first world businesses. Finally, he argues that the process of sensitizing young Americans to the world's cultural diversity can be fulfilled by those Americans who take positions throughout the world teaching English. Since these young men and women are employed by foreign governments, private businesses and schools, they can "attain cultural and frequently linguistic expertise at the expense of the foreign government or business rather than the American taxpayer." Ted concludes, "This shows the value of dispersed, privatized and cost-free solutions to problems rather than the types of central, public and costly solutions that have so reduced our competitive edge over the past 60 years."

We thank Nancy and Ted for writing in, and we would like to invite all our readers to do likewise—perhaps in response to Ted's letter (abbreviated above)—or to any of the articles printed in *On the Horizon*.

On another note: Jonathan Fife, Editor, ASHE/ERIC Higher Education Report Series, wants to ascertain the feasibility of commissioning biannual reports focusing on an environmental scan of higher education. These reports would include all of the information items in our data base (with their implications for colleges and universities) collected in our continuous scanning process. Please complete the form inserted in this copy indicating your sentiment about the desirability of the scan becoming a part of the ASHE/ERIC series. We will forward your reply to Jon.

The October issue of *On the Horizon* is in process already. So renew your subscriptions now. And please consider this: a site license entitles you to both a personal copy and an easily reproducible-for-distribution copy that identifies your organization and site license number.

Until October . . . JLM

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